A BOOK IS MADE FOR YOU

Of making many books there is no end.

ECCLESIASTES

A Book is Made for You

by

R. H. HAVERCROFT

With fifteen illustrations in half-tone and sixteen line drawings

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For
DOROTHY, TONY,
SUSAN, AND BELINDA

Preface

IN writing this book I have had in mind particularly three classes of reader. Firstly, I hope that what I have written will be of interest and value to those young people who are just starting in the book trade, whether it be in publishing, bookselling, papermaking, printing, or bookbinding. His interest in the job in any of those industries will be greatly enhanced if the individual learns something of the historical background and something of the other fellow's job. Secondly, I hope that I may also interest the upper forms of schools. Books play such an important part in their lives that some insight into how books have been and are made must surely add interest to their studies. Finally I hope that the general reader will not be altogether uninterested in learning something about the great heritage which is ours in the crafts and skills of the makers and purveyors of books.

I am greatly indebted to Mr J. R. Tanner, of Butler and Tanner, Ltd, Frome, who was kind enough to criticize the sections on modern printing processes, and to Mr A. H. Bruce, C.B.E., D.L., of Henry Bruce and Sons, Ltd, for kindly putting me right on a number of points in the papermaking sections. Any faults remaining in the book are entirely my own!

Many friends have helped me over the illustrations, and I should like to acknowledge their help: My daughter, Susan, who drew most of the text illustrations; the Technical Section of the British Paper and Board Makers' Association (Inc.) for Figs. 3, 5 and 6; Henry Bruce and Sons, Ltd, for the papermaking photographs for Plate IV; the Stationers' Company for the reproduction of their Charter; Butler and

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The illustration of *The Book of Kells* is reproduced by permission of the Board of Trinity College, Dublin. The illustrations of the Rosetta Stone, the Gutenberg Bible, the Codex Sinaiticus, and the *Recuyell of the Historyes of Troye* are the copyright of the British Museum; all are reproduced by permission.

Finally, I should like to acknowledge my publisher's unfailing help and encouragement.

R. H. H.

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Part One: Books in the Past

1

What is a Book?

IN the fourth chapter of the Gospel according to St Luke there is told the story of how Jesus came back to his home town, Nazareth, and went, as usual, to church on the sabbath day. His fame had already reached Nazareth, and it is not surprising to find that he was asked to read the lesson. If you have read the story you may remember that he was handed the book of the prophet Isaiah and that he read part of it to the people in the church. The Authorized Version of the Bible says that he then "closed" the book, but the Moffatt version, which tells the story in modern English, says that he "rolled up" the book.

If you have read the modern version, perhaps you have wondered what sort of book it was that Jesus read from. Well, in the following chapters I want to tell you about some of the 'books' that people used years ago, and explain to you how the sort of book you use gradually came to be.

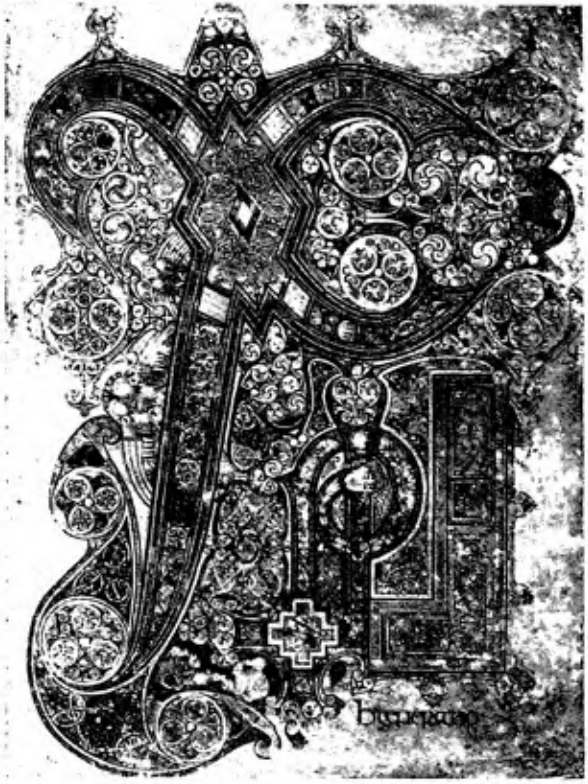
What is a book? I suppose most people would answer this question by saying that a book is a number of sheets of paper fastened together at one edge by some kind of binding in such a way that the whole can be opened for writing on or for reading what has already been written or printed upon the leaves. But it was not always so.

If we examine some of the English words which are associated with reading and books we shall begin to glimpse some of the materials which were the forerunners of the modern book. All our books (except those rag books which you had when you were small and tended to tear things to pieces) are printed on *paper*. That word is derived from the Latin

papyrus, the name given to the reeds which grew on the banks of the Nile. We call the sacred book of the Christian religion the *Bible*. This word is derived from the Greek word *biblion* (Latin, *biblia*); but *biblos* (of which *biblion* is a diminutive) meant the *papyrus* reeds of the Nile. The place where books are kept is called in English a *library*. The Latin word for a book was *liber*, but this word also meant the outer skin of the *papyrus* or the bark of trees. Sometimes the writing-pad you use is called a *tablet*, a word which comes to us through the Old French language from the Latin word *tabula*, which meant a small board or *table*. Before we leave this consideration of words and their derivations we must not forget that we ourselves call two pages of a book a *leaf*, a word which also suggests the foliage of plants and trees.

All these words we have been considering suggest, quite correctly, that reeds, the bark and leaves of trees, stone, and wood were all at one time or another used as writing materials. Nor were these the only materials which the ancients used. Bones, various metals, potsherds (pieces of broken earthenware), the skins of animals, silk, tiles, and bricks were also used. It is even said that Euclid worked out his propositions on the sands of the seashore. In the following pages we shall try to trace how these primitive methods of recording men's thoughts have developed, sometimes gradually, sometimes, because of some special invention, more quickly, into the books which are such familiar objects in our daily lives.

PLATE I

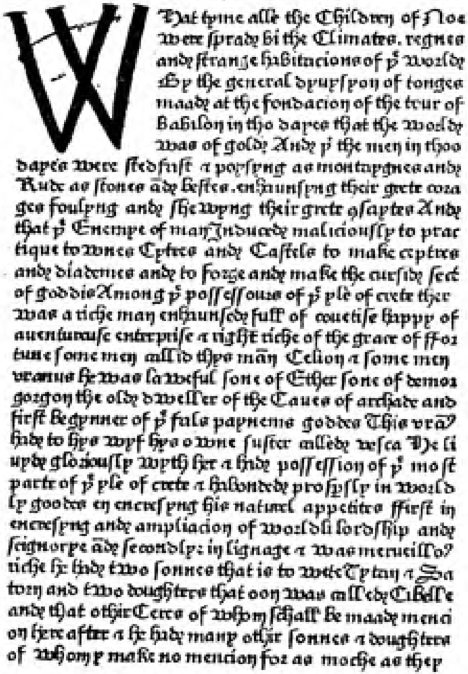


A Page from "The Book of Kells"
See p. 26.

The Rosetta Stone
See p. 18.

A Page from the Gutenberg Bible

See pp. 33–34.



What tyme alle the Children of Noe
were sprad bi the Climates. regnes
and strange habitacions of ye world
By the general dyvysyon of tonges
maad at the fondacion of the tour of
Babilon in tho dayes that the world
was of gold. And ye the men in thoo
dayes were stedfast & poysyng as montaygnes and
Rude as stones and bestes. enhaunsyng their grete cora
ges foulyng and shewyng their grete ofaytes And
that ye Enemye of man Inducede maliciously to prac
tique to make Cytees and Castels to make ceptres
and diademes and to forge and make the cursid sect
of goddis Among ye possessours of ye ple of erthe ther
was a riche man enhaunsed full of couetise happy of
auenturouse entreprise & right riche of the grace of Ffor
tune some men called thys man Celion & some men
vranus he was laweful sone of Ether sone of demo
gorgon the olde dweller of the Caues of archade and
first begynner of ye fals paynems goddes This vra
nus hade to hys wyf hys owne suster called vesca He li
uyde gloriously wyth her & hade possession of ye most
parte of ye ple of erthe & habonded prosperly in world
ly goodes encresyng his naturel appetites ffirst in
encresyng and ampliacion of worldli lordship and
seignorye and secondly in lignage & was merueillo
riche he hade two sonnes that is to wete Tytan & Sa
turn and two doughters that oon was called Cibelle
and that other Ceres of whom shall be maade menci
on here after & he hade many other sonnes & doughters
of whom y make no mencion for as moche as they

A Page from "Recuyell of the Historyes of Troye"

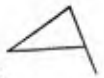
See p. 30.

2

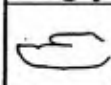
The Beginning of Writing

IN the previous chapter we saw how the words we use in connexion with books suggest some of the materials which men used before modern writing materials were invented. Many of these records have survived until the present day and can be seen in our museums. Others have perished with the passing of time, and our only knowledge of them comes from references to them in other writings. Some are to be seen only by visiting foreign countries, because they are in the form of monuments, like the Pyramids of Egypt.

It must be remembered that drawing came before writing; there are, for instance, cave drawings in South Africa and in the South of France which are older than any existing written records. In Rudyard Kipling's *Just So Stories* you can read that writer's story of the birth of the alphabet. Although it is a fanciful story, it shows very clearly how letters (without which writing would be impossible) evolved from pictures. Much of the early writing that has survived is in the form of hieroglyphs, which is the name given to the little picture characters used by the ancient Egyptians in writing. These hieroglyphs survive in three forms, which are known as hieroglyphic, hieratic, and demotic. In the first the characters are all easily recognizable pictures, in the second only the main features of the pictures are preserved, while in the third form the pictures are so modified that in many instances they are merely conventional signs for the original hieroglyphs. For instance, a hieroglyph representing a hand, like this  , becomes in hieratic a symbol like this

 , and in demotic merely a sign like this  . The knowledge of hieroglyphic writing was lost for hundreds of years, until, at the beginning of the nineteenth century, an Englishman named Thomas Young deduced the correct values of some of the characters. It was known that a king's name was always written within an oblong cartouche (from the Latin word *charta*, meaning a paper) with rounded ends, thus  , but it was not known at which end the name began. Study of two monuments, the Rosetta Stone in the British Museum and a stone obelisk from Philae now standing in the park at Kingston Lacy, in Dorset, yielded the key. Each of these stones bears a Greek as well as an Egyptian inscription, and it was known that the Egyptian kings were accustomed to write their edicts in both languages. From this fact it was deduced that the two inscriptions were the same. The subsequent investigations which finally solved the secret of the inscriptions were brought to a triumphant end by J. F. Champollion, and on his painstaking efforts all modern work on hieroglyphics is based.

The alphabet with which we are familiar is based on this hieroglyphic writing, as the following table will show:

Hieroglyphic	Hieratic	Greek	Roman	English
 an eagle		Ada	Adaa	Aaa
 a hand		ΔΔδ	ᗡDdd	Ddd
 a mouth		ΔPρ	ᗡRᴛ	Rᴛᴛᵣ

So, you see, Kipling's story is not really far from the truth.

3

Recording Men's Thoughts

WE have seen that, before the invention of paper, men used all sorts of materials on which to record their thoughts. We have seen, too, how stones from ancient Egypt have yielded up their secrets to the painstaking researches of modern scholars. It is to ancient Egypt that we turn again (and to ancient China) when we come to the early forerunners of paper. We have already traced in some English words what some of the earliest materials were. Let us look at a few more before we pass to the earliest forms of paper. At Memphis, the ancient capital of Lower Egypt, a piece of sycamore wood was found which bore an inscription over 5000 years old. Plutarch, a Greek writer of the first century A.D., refers to Solon and Draco, two Athenian statesmen who lived 600 years before Christ, and says that the laws which they made were used to make the pot boil. This is believed to be a joking reference to the fact that they were inscribed on wood. The laws of ancient Rome were carved on oak boards and exhibited in the Forum. Perhaps, if our modern legislators knew that the laws they passed had to be laboriously carved on wood and exhibited in Trafalgar Square, they might curb their desire to pass quite so many! The Pontifex Maximus, a Roman dignitary, wrote his annals on wooden boards coated with white lead. The Latin word for 'white' is *albus*, and these boards were called *albums*, a word which we still use for a blank book. In later times the Roman laws were engraved on tablets of brass, and Roman soldiers' discharge 'papers' were inscribed bronze tablets. The rate of demobilization after the last war

would have been very much slowed down if each sailor, soldier, and airman had had to wait while his discharge 'papers' were prepared in this way!

All these methods of writing were cumbersome, slow, and expensive, and, as always when their wits are challenged, men began to think of improved ways of recording their words. The skin of animals, dried and dressed, was widely used, as parchment (the skin of sheep and goats) and vellum (the skin of lambs). Parchment and vellum were much less clumsy than other materials, but they were still expensive, and still cheaper materials were needed. The ancient Egyptians invented papyrus, made from the reeds which grew in great profusion on the banks of the Nile. Papyrus was made as a two-ply sheet by laying strips of the skin from the reeds on top of each other. One set of strips was laid vertically, the other set horizontally, and then the sheet was baked. The juice of the reeds acted as a gum to hold the two skins together. The sheets were twelve or eighteen inches square, and as many as twenty would be gummed together to form a roll. The sheet was called, in Latin, a *scheda*, from which we get our English word, *schedule*. After baking the papyrus was polished to make for greater ease of writing. The ink used was made by mixing gum and charcoal and diluting the mixture with water. The gum in the mixture made the ink stick to the papyrus, and, of course, the charcoal gave the fadeless colour. The ink was applied with a pen made from the hollow stalk of a reed. Being compounded of gum and water, this ink could easily be erased by means of a wet sponge, and the papyrus could be used over and over again, an important point because even papyrus was not cheap to produce.[1]

The oldest Egyptian papyri so far discovered are in the Louvre in Paris. It is estimated that they were written between 2000 and 2500 years before Christ, but it is thought

[1] A papyrus which has been used more than once is called a *palimpsest* (from the Greek *palin*, meaning "again," and *psaein*, meaning "to rub smooth").

that papyrus was used 500 years earlier even than this. The Egyptians were the inventors of papyrus, largely because they had all the raw materials to hand on the banks of the Nile. But it was not very long before the Greeks and, later, the Romans began to import papyrus from Egypt. The first Greek papyri, however, were not brought to light until 1752, when the site of Herculaneum was excavated. Further discoveries of Egyptian papyri were made in the year 1778 at Gizeh, when about fifty rolls were discovered. But, alas! there was nobody there who realized their value, and they were burned. At the beginning of the nineteenth century more rolls were found on the site of Memphis, some of them historical records, others private letters. Some of these letters seem very like our own, complaining of the high price of food and the shortage of money. Other papyri take the form of poems, speeches, petitions, contracts, wills, prayers, and Biblical texts.

These Biblical texts are among the most important of all papyri. When those unhappy people the Jews were scattered by war and persecution many of them settled in Alexandria, where seventy-two scholars translated the Old Testament from Hebrew into Greek for the benefit of those Jews who could speak and read Greek. Three copies of this Greek Old Testament, written on vellum, remain, and also some fragments of two older copies on papyrus.

The earliest papyrus and vellum books were written on long strips of material, rolled on rods, and put into cylinders. The Latin name for one of these cylinders was *volumen*, from which we get our English word *volume*. The writing on these rolls was in columns, and the roll was read from left to right, column by column. These rolls were very cumbersome, and after a time somebody thought of keeping the sheets of vellum and papyrus separate and binding them into a square block, called a *codex*, from the Latin, *caudex*, which meant a tree-trunk, and later a tablet or a book. These codices were much more compact than rolls. For instance, the *Iliad* and

the *Odyssey* of Homer were bound in one parchment codex, whereas they would have occupied forty-eight rolls or volumes.

The three vellum copies of the Greek Old Testament are codices, and are known as the Codex Sinaiticus, the Codex Vaticanus, and the Codex Alexandrinus. The Codex Sinaiticus is so named because it was discovered at a monastery on Mount Sinai about a hundred years ago by a German theologian named Constantine Tischendorf. For years it reposed in the Russian National Library at St Petersburg (now Leningrad), but in 1933 it was bought for the British Museum at a cost of £100,000. The Codex Vaticanus is so named because its home is in the library of the Vatican. It contains the New as well as the Old Testament. The third copy, the Codex Alexandrinus, takes its name from Alexandria, and was presented to Charles I by the Patriarch of Constantinople in 1628. It remained in the royal library until 1757, when George II presented it to the new British Museum, where it still is.

The papyrus fragments were probably written partly before A.D. 150 and partly about a century later, while the codices date from about the fourth century A.D. These fragments are known as the Chester Beatty Papyri, after their owner. They are now deposited in the British Museum. Only a portion of the Bible survives in them, and they form parts of two papyri, each of which most probably contained not only the Old Testament, but also the New Testament and the Apocrypha as well. The parts which remain include Numbers, Deuteronomy, Genesis, Isaiah, Ezekiel, Daniel, Jeremiah, Ezra, parts of the Gospels, the Acts of the Apostles, and some of St Paul's letters.

These rolls of early writing which we have been considering have all been, as you will have noticed, portions of holy Scripture, but there are many other rolls of later date, rolls of parchment and vellum, preserved in museums all over the world. These take the form of accounts, registers, records of

legal cases, statutes, and the like. You will find it interesting and, indeed, exciting to discover these in your own local museum. You may like to try to decipher some of the writing, and notice how it varies from your own.

4

From Rolls to Books

WHILE these rolls and codices were being written manuscripts were being produced in a form much nearer in shape to our books. You will have noticed that in a modern book the top, bottom, and front edges are usually cut so that you can turn the pages, but the fourth edge, which is held by the binding, is not cut. This is a relic from the days of the earliest parchment books. The scribe (from the Latin *scriptor*, "a writer") began with four sheets of parchment which he folded down the middle, making eight leaves, or sixteen pages, as we should call them. When he had finished writing these sixteen pages he took four more sheets of parchment and repeated the process, and so on. These pages, however, were not numbered in the way we use for numbering the pages of a modern book. Only the leaves, or folios, as they are called, were numbered, but, to make reference easier, the top side of each folio (the right-hand page, as we should call it) was often numbered 1a or 1r (r=*recto*, on the right hand) and the under side (the left-hand page) 1b or 1v (v=*verso*, or reverse side). Thus the numbering ran 1a (or 1r), 1b (or 1v), 2a (or 2r), 2b (or 2v), and so on. These folded sections of sixteen pages (or eight folios) were then sewn together at the folded edge to form the complete manuscript. This process is known as gathering, and the number of gatherings varied considerably according to the length of the manuscript.

Much of this manuscript writing must have been dull and tedious work, but if you look at any of the many beautiful manuscripts in your local museum you will not find any

signs of weariness in the careful, and often beautiful, writing. The art of writing as practised by the medieval scribes was a labour of love, and was seldom done against time. Thousands of these manuscripts, mostly by unknown hands, survive, and will well repay your study of them. The ink too has survived wonderfully well.[1]

Many of these manuscripts were not only written in beautiful writing; they were also 'illuminated'—that is, they were decorated with little pictures in gold and silver leaf and many bright-coloured paints, which seem to illuminate, or light up, the dull grey of the parchment and the heavy black of the ink.

The earliest known illuminated manuscript is the Lindisfarne Gospels, which was finished about A.D. 700. This magnificent book was made by the monks of the little island of Lindisfarne, off the coast of Northumberland. Here Oswald, King of Northumbria, and Aidan, Bishop of Lindisfarne, built a monastic church, the ruins of which can still be seen. The monks of those days were craftsmen in wood and stone and metal, as well as being scribes and illuminators. They built their own churches and decorated them with marvels of sculpture and carving, and furnished them with exquisite taste. All their artistic gifts were dedicated to the idea of making the worship of God as dignified and beautiful as possible; and in like manner the scribes and illuminators were striving to put the Gospels and the other books of the Christian faith into the most beautiful form they could conceive. The missionary monks who set out form Lindisfarne and other monastic houses went out equipped with these beautiful books to seek to convert to the Christian religion the people in other parts of England.

[1] The word 'ink' comes from the Greek *enkauston* (Latin *incaustum*), which suggests a burning-in process. The earliest inks were made either from the blackish liquid which a cuttlefish exudes when pursued or from a mixture of gum and soot or charcoal or from various metallic compounds. As we have seen, these inks could be sponged off the papyrus so that the sheets could be used again, but they have retained their colour to this day.

There was a famous monastic school at Jarrow, where the Venerable Bede, who lived from A.D. 673 to 735, spent the greater part of his life. From this monastery many young monks went out to convert the people of the north-east of England, taking with them some of the beautiful illuminated manuscripts for which their school was justly famous. But Bede's monastery at Jarrow became even more famous because of the writings of Bede himself. His *Ecclesiastical History of the English People* (in Latin, *Historia Ecclesiastica Gentis Anglorum*) was the first history of England. It was later translated into Anglo-Saxon by King Alfred. The Venerable Bede wrote some forty books in all.

One other monastery must be mentioned in this chapter. It was that at Kells, in County Meath in Ireland, where the monks produced *The Book of Kells*, an illuminated manuscript of the four Gospels, together with some local records. *The Book of Kells* is a most beautiful book and the finest existing example of Irish illuminated work. It is now in the library of Trinity College, Dublin.

The coming of the Danes to Britain caused the monks of many monasteries to flee westward. They naturally took their manuscripts with them. As a result of the Danish invasion the centre of learning and Christianity shifted to Winchester, King Alfred's capital. Alfred himself was a great scholar. As we have already noticed, he translated the Venerable Bede's *History* into Anglo-Saxon. He also translated parts of the Gospels into Anglo-Saxon.

With the coming of the Normans in 1066 scholarship in England received a new impetus. Edward the Confessor, who spent many of his early years at Jumiège, in Normandy, before he became King of England, had introduced Norman monks into the country. One of them, indeed, became Archbishop of Canterbury. These monks from Normandy brought with them new ideas in architecture, in writing and illuminating, and in other arts. When the Normans conquered England many more monks came across the Channel,

and their influence can still be seen in the great cathedrals at Durham, Canterbury, Winchester, Hereford, Gloucester, and in various other places. These same monks who lavished such great skill and industry on the building of beautiful churches and cathedrals similarly brought their talents to bear on the production of beautiful books. For all the new churches they produced wonderful handwritten copies of the Bible, beautifully coloured and often with illustrations painted into the large initial letters at the beginnings of the various chapters. Some of these initial letters contained as many as twenty or thirty tiny pictures depicting scenes from the Old and New Testaments.

Not all the pictures in the books of this period, however, were of Biblical scenes. If you look at any ancient church you will almost certainly find somewhere some queer, grotesque figures. Sometimes you will find them on the outside, carved in the stone or serving as gutter-spouts, the rainwater from the roof gushing through the mouths of the strange creatures. (These, by the way, are called gargoyles.) Inside the church you may find similar figures carved on the ends of benches, in odd corners of the roof, or on the undersides of the little tip-up seats called misericords. Nobody quite knows the origin of these queer, beast-like figures. In the age when they were made the ordinary people were very credulous, and it may be that travellers came back from far-off lands with stories of fabulous beasts which the stay-at-homes had never heard of. Whatever their origin, these strange animals found their way into many illuminated books. Such books are called *bestiaries*. The reading matter consists of an allegory in which human beings are satirized under the form of beasts, birds, and fishes. The story of Reynard the Fox and the nursery rhyme "Hey diddle diddle" are relics from these old bestiaries. Examples can be seen in the British Museum and at Oxford and Cambridge.

We must not end this chapter without reference to the *Psalter*, the book of *Psalms*. From the very earliest times the

Psalms have been included in the worship of the Church, either sung or recited. It was therefore natural that the scribes and the illuminators who produced the beautiful books of the Middle Ages should often turn their attention to this favourite book of the Bible. Some of the Psalters are very beautiful indeed, The book known as *Queen Mary's Psalter* in the British Museum is the finest example in Britain. It gets its name from the fact that a customs officer managed to prevent its being smuggled out of the country and presented it to Queen Mary Tudor. It has been described as a "veritable queen amongst illuminated manuscripts." It contains over a thousand pictures, mostly depicting scenes from the life of David. There are 223 drawings of Old Testament subjects, twenty-four calendar drawings, two for each month, showing the occupations appropriate to each month and the signs of the zodiac for each month, paintings of events in the life of Christ, over 200 marginal pictures which make up a bestiary, and many others. All these pictures were the work of one man, but nobody knows who he was. Like so many of the great artists and craftsmen whose work has survived them, he spent his life making beautiful things and then passed into complete oblivion.

There is another Psalter, known as the *Tickhill Psalter*, in the Public Library in New York, which contains over 500 pictures. The creator of this work was John Tickhill, prior of the monastery at Worksop from 1303 to 1314. It is a beautiful book, but does not compare with the *Queen Mary Psalter*.

Another Psalter, which was bought for the British Museum by public subscription in 1930, is the *Luttrell Psalter*. This book is unlike the others in the quantity of secular pictures it contains, depicting scenes from daily life—a dog jumping through a hoop held by a bishop, a wrestling match, an execution, a lady at her toilet, an acrobat, bear-baiting, and many others. The artist is unknown, but it *is* known that this Psalter was produced in the middle of the fourteenth

century to the order of Sir Geoffrey Lutterell (or Luttrell).

We have not the space in this little volume to consider all the many beautiful illuminated manuscripts that are still in existence. In addition to Bibles, Testaments, and Psalters there are *Horae* (books of hours), which set out the prayers and observances for each hour of the day, missals or Mass-books, which give the words of the Sacrament of Mass, and primers, books of devotions.

5

The Coming of Printing

UNTIL now we have been thinking only of books which were handwritten on parchment or vellum. We, who are used to reading printed accounts of events a few hours after they have happened, find it difficult to remember that a little over five hundred years ago every word that was read had to be written by hand. And the only way of reproducing further books was laboriously to copy the existing ones by hand. To produce twenty copies of a book by hand takes approximately twenty times as long as to produce one copy; but in printing, once the type is set up, thousands of copies can be produced in a matter of hours. William Caxton, the first English printer, about whom we shall talk later, was very much concerned about this very point. In his own book (the first one he printed), *Recuyell*[1] *of the Historyes of Troye*, he tells how he promised copies of it to various patrons and friends. He goes on (in his own words): "In the wrytyng of the same my penne is worn, myn hande wery and not stedfast, myn eyen dimmed with overmoche lokyng on the whit paper." And so, he says, he learned and practised the art of printing, at great trouble and expense to himself, so that his friends could all have the book "in prynte after the manner and forme as ye may here see."

But printing as we understand it to-day did not come all at once. The forerunners of printing from movable pieces of type were block-books—that is, picture books printed from carved blocks of wood. Such block-books had been printed in China in the tenth century, and they appeared in

[1] 'Recuyell' means a gathering together, a collection.

Britain early in the fifteenth century. It was not long before lines of descriptive text were added to the pictures, picture and wording being cut on the same block of wood. Some block-books were printed on one side of the paper only, a sheet of paper being placed on the inked block and pressure applied to the back of the sheet. Later books were printed on both sides of the paper, and were produced in a simple press.

It can readily be seen that, once the wood blocks were cut, it was a comparatively simple matter to print copies from them. But the cutting of the blocks was a slow and laborious process: for each letter, as well as each picture, had to be carved by hand in reverse, so that in the print both pictures and words appeared the right way round.

It is not surprising, then, to find that the process was reserved for works which would have a large and continuous demand, so that the blocks, once cut, could be used over and over again. Block-books, therefore, are mostly popular books of religious instruction, a subject which readily lent itself to pictorial illustration.

The most popular of all the block-books was the *Biblia Pauperum*, or *Poor Man's Bible*. It must be remembered that the only Bibles available in Britain before John Wyclif issued his translation were in Greek or Latin, so that only scholars could read or understand them. In the same way the ordinary peoples of Europe were denied the Bible in their own tongues. The *Poor Man's Bible* was designed to give the uneducated reader the most important events in the life of our Lord, with those passages from the Old Testament which were believed to foretell His coming. The upper half of each page was occupied by a picture, and the lower half by an explanation of the picture.

Another interesting block-book which has survived is *Ars Moriendi*, a book which depicted in picture and word the trials and troubles which face dying men and women, and the spiritual means available for meeting them. None of these block-books was printed in Britain, and very few in

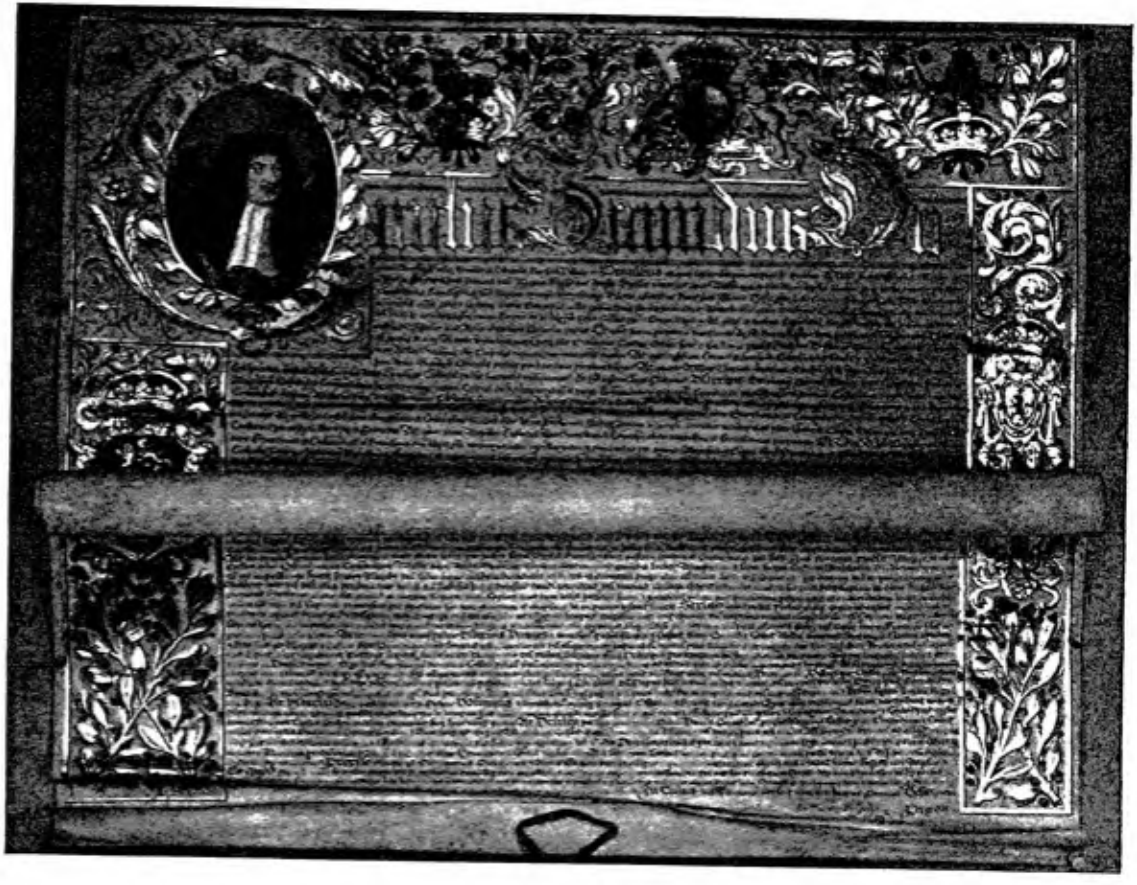
Italy or France. Most of them came from Flanders and Germany.

If printing had not advanced beyond block-books it is doubtful whether this method would ever have ousted the preparation of books in manuscript as a means of spreading knowledge. We have seen that block-books were an advance only in cases where there were many pictures and little text and where many copies were required. What was wanted was a method whereby many thousands of words could be assembled comparatively quickly—in other words, a system of printing from movable pieces of type.

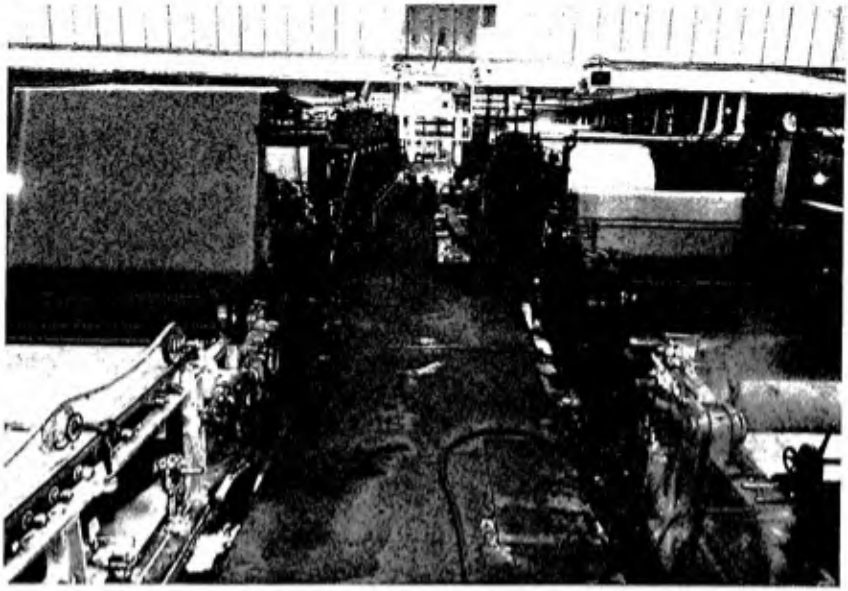
The Chinese had used movable types in the eleventh century, but they were handicapped because they had many hundreds of different characters, each of which required a separate piece of wood or metal, and little progress was made. In Europe printing from movable types did not begin until the fifteenth century, and the invention is now credited to a German, Johann Gensfleisch zum Gutenberg, of Mainz, although at one time the invention was claimed for a Dutchman, Laurens Janszoon Coster, of Haarlem.

Laurens Janszoon Coster is believed to have been an innkeeper. The surname Coster is the Dutch word for "sexton," and he held this position in the parish church of Haarlem. His champions claim that he discovered how to print in the year 1440, and that in 1441 he printed his first book *The Mirror of our Salvation*, a book printed on the plan of the *Poor Man's Bible*, half woodcut pictures and half descriptive text. But, although it is claimed that he employed some apprentices, no books bearing his name have survived. It is even said by some that one of his apprentices stole his type and fled with it to Mainz. Students of early printing generally have rejected his claims, although in the United States considerable interest is still shown in what is now called "the Haarlem Legend."

Of the man who is almost universally accepted as the inventor of printing, Johann Gutenberg, more is known.

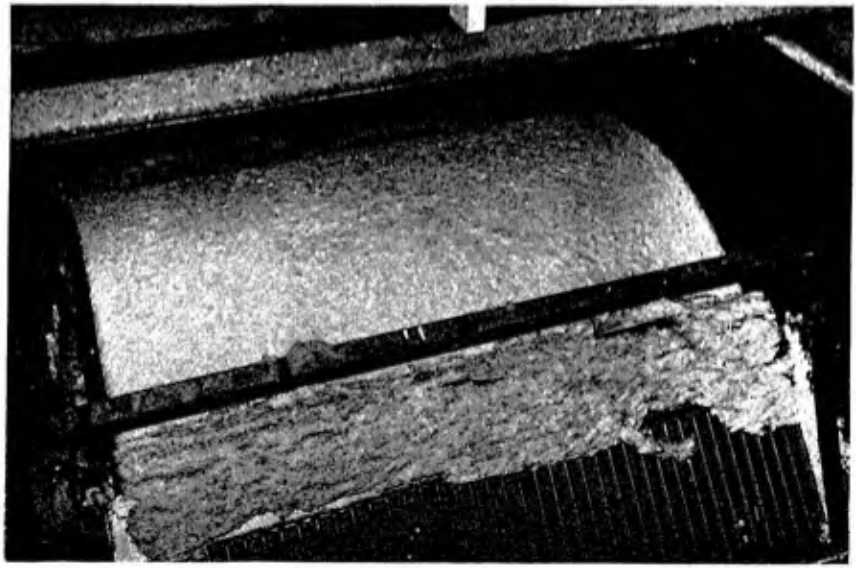


The Charter of the Stationers' Company
See p. 49.



Papermaking Machines: General View

See pp. 80–83.



A Papermaking Machine: At the Wet End

See pp. 80–81.

His father's name was Gensfleisch, but, after the custom of the time, he was known by his mother's surname, Gutenberg. He was born in Mainz, in Germany, of good family, in the year 1400. In 1434 he was living in Strasbourg, and we learn of his interest in printing from an agreement by which he undertook to teach Andreas Drysehn and some other citizens what are described as "secret arts," and from a lawsuit in which he was involved. In the course of this lawsuit, in 1439, a goldsmith claimed that in 1436 he had sold Gutenberg some printing materials.

It is not known definitely when Gutenberg moved back to his native town, but in the museum at Mainz there are preserved certain fragments of printed work attributed to him. Gutenberg was associated with two other men, Johann Fust, a lawyer, who put up the money to finance the venture, and his son-in-law, Peter Schoeffer. Exactly what part each of these played in the partnership is not known for certain, but Gutenberg is confidently believed to have been the inventor. The oldest fragment in existence is the *Fragment of the World Judgment*, part of a single leaf of a poem in German. The complete book would have run to 37 leaves, or 74 pages. It is considered that this fragment was printed by Gutenberg between the years 1444 and 1447. Another fragment is that of *An Astronomical Calendar* for the year 1448, which must have been printed in 1447 or early in 1448. Then, in the year 1456, there appeared the first Bible in printed form, the Mazarine[1] or Gutenberg 42-line Bible. This magnificent book contains nothing to show by whom it was printed, but the experts who have examined it are satisfied that it was the work of the Fust-Gutenberg partnership. As Fust was only the financial partner and Gutenberg the technical partner, it is natural that the credit for this first great book should go to the craftsman. The Fust-Gutenberg partnership began in 1450, and the 42-line Bible probably occupied

[1] The name 'Mazarine' is given to the 42-line Bible because it was discovered in the library of Cardinal Mazarin.

Gutenberg and his workers for most of the six years between 1450 and 1456. It was in two volumes, containing altogether between 1200 and 1300 pages, set, as are many modern Bibles, in double column. A portion of one of the pages is shown in Plate II. If you compared this with a manuscript of the fifteenth century you would notice that the typeface—*i.e.*, the shape and character of the letters—was a close copy of the handwritten characters. Later on we shall see how the printer's typefaces gradually moved away from the handwritten style to distinctive forms of their own.

Unfortunately, the Fust-Gutenberg partnership did not last. Somewhere between 1454 and 1456, even before the Gutenberg Bible appeared, the partnership had foundered. In 1455 Fust sued Gutenberg, unsuccessfully, for the repayment of the money he had lent him, and in 1457 Fust and his son-in-law, Peter Schoeffer, started printing on their own account. Little is known of Gutenberg's subsequent history. He found another partner in Mainz, one Conrad Hummer, and there is some evidence that he produced further books. He died in 1468. The church in which he was buried has disappeared, and with it any memorials to him there may have been. But Gutenberg has no need of any memorial other than the books which we read and handle every day.

In 1457 Fust and Schoeffer issued a magnificent Psalter. This book was a tremendous advance on anything which had so far appeared. It was printed throughout in black and red, with large floriated—*i.e.*, decorated with a floral design—initials, printed in two colours. In printer's language the colours are in perfect register. That means that the colours do not overlap at any point, but fit tightly together. This book was a milestone in the progress of printing. From this moment the craft went triumphantly on, occasionally slipping back, but always in the end moving forward.

For a time Mainz retained a monopoly of printing, but naturally it could not retain it for long. The art soon began

to spread, first to Strasbourg and later to Cologne, where Ulrich Zell set up a press in 1465. By the end of the fifteenth century there were presses in fifty-one towns in Germany, and printing had spread into other European countries. Italy was the first of these, for two Germans set up a press in Subiaco in 1465 at a Benedictine monastery. They printed four books, one of them being an edition of *Donatus*. Aelius Donatus was a fourth-century grammarian, and his book *De octo partibus orationis* was as familiar to schoolboys of the Middle Ages as *Euclid* was to our fathers or as his "School Arithmetic" is to the schoolboy of to-day. Almost all the early printers included this book among their first productions. In 1467 these two Germans, Sweynheym and Pannartz, moved their press to Rome, but the move did not bring them much success, for five years later they had to petition the Pope for help. Their petition is interesting because it gives an account of the work they had so far done. They had printed twenty-eight different books in editions which mostly consisted of 275 copies. In all they had printed a total of 11,475 volumes, no small achievement in those days.

The art of printing soon spread to Venice, Florence, Naples, and Milan, and we must briefly notice two of the other pioneers in Italy. One was a Frenchman, Nicolas Jenson, whose beautiful type was long admired; the other Aldus Manutius, who gave his name to a type which has its counterpart in modern times, Aldine Bembo. In France, Holland, and Switzerland printers began to work, and also in Belgium, a fact which is of special interest to Englishmen. For at Bruges, in Belgium, an Englishman named William Caxton worked in partnership with Colard Mansion before coming back to his native land to become the first English printer.

William Caxton was a Kentish man, of good family, who received a sound education before being apprenticed to Robert Large, a mercer in the City of London. His master was an alderman of the City and, for a term, its Lord Mayor. If William had remained in London he might have followed

in his master's footsteps, but Robert Large died in 1440, before Caxton had finished his apprenticeship. Forced to find another master, Caxton elected to go to Bruges, where there were a number of English wool-merchants. He prospered so well that in 1452 he had the title of "acting-governor of the English Nation in the Low Countries." When in 1470 Edward IV visited Bruges Caxton's services in this capacity were brought to the King's notice, and he was taken into the service of Margaret, Duchess of Burgundy, Edward IV's sister. This was a turning-point in his life.

For some years Caxton had spent his spare time in translating into English a French version of the history of Troy. His new patron encouraged him in his work, and he decided to have his translation printed. He had already some acquaintance with printing, and, in partnership with Colard Mansion, he became his own printer. *Recuyell of the Historyes of Troye* was printed in English, as were the two or three other books which Caxton and Mansion printed. In 1476 Caxton returned to London and set up a printing-press in Westminster. The house in which Caxton settled was opposite the Chapter House of the Abbey, where the House of Commons then met. He was thus able to have outside his house a stall where he could display his books for the benefit of Members leaving the House. Later he took additional premises at the "Sign of the Red Pale."[1]

Caxton's press was the first in England, and from it came a long series of books. The first was the *Dictes and Sayingis of the Philosophres*, issued in 1477. It contained an additional chapter on women, written by Caxton himself. Before he died, in 1491, he had printed about a hundred books, including the first edition of Chaucer's *Canterbury Tales* to be printed in English, *The Golden Legend* (in Caxton's own translation), and Malory's *Morte d'Arthur*.

[1] Before houses had numbers they were distinguished by means of signs hung over the doors, rather like the inn signs which we see to-day. The "Red Pale" was a shield with a red vertical stripe dividing the white ground of the shield into two.

Caxton's books are not among the most beautiful, but his importance cannot be overrated. He was a sound businessman, and he did not waste his time on printing the classics and theological treatises which scholars could already buy more cheaply from the Continent. He did, however, produce a number of books of poems and romances, which undoubtedly encouraged the popular demand for such books. As a translator, too, he brought many French books within reach of English people.

We have already noted that the earliest printed books copied the appearance of handwritten manuscripts and that they are difficult to tell apart. These early books copied not only the writing in their types, but at first they still employed the rubricator to add the initials, at the beginnings of chapters, headlines, and other decorations. Blank spaces were left for these things on the printed page, and the rubricator added them by hand. When the printer first began, the only plan he had in mind was to produce more copies of a manuscript, and, indeed, he tried to make his book *look* like a manuscript. As the art of printing developed, however, the printer evolved his own typefaces, the roman and italic types which we know to-day being the eventual outcome.

Another way in which early printed books copied manuscripts was in the ending. When the scribe had finished his work he wrote *Finis* or *Explicit*, followed by the name of the book and the author, but he seldom added his own name or the date. So when the early printers finished a book they added a note of the title and the author, but not their own name or the date. Fust and Schoeffer were the first to add further details. At the end of the *Psalter*, which they printed in 1457, they added a short paragraph stating that the book was fashioned by the new invention of printing, without writing by hand, by the diligence of Johann Fust, citizen of Mainz, and Peter Schoeffer, of Gernsheim, and finished on the Vigil of the Feast of the Assumption in the year 1457.

Caxton

Aldus Manutius

Plantin

The Estiennes

FIG. 1. SOME EARLY

See

The Elzevirs

Grafton

Myllar

Day

The earliest books had no title-pages (they did not come into fashion until 1480); the title and author's name were given only in the *colophon*, as the little paragraph referred to above was called. The earliest title-pages consisted of the title of the book and the author's name, the publisher's name and the date, which we are accustomed to see there, being omitted. The rest of the title-page came to be filled up either by the printer's device or by a woodcut illustration. The printer's device was at first purely a trademark. (One of Caxton's devices is shown at page 38.) Aldus Manutius of Venice used a dolphin and anchor, the Estiennes the tree of knowledge, Plantin of Antwerp a compass, and the Elzevirs a tree (see pages 38–39). A later development was the canting (or punning) device, which became very popular in France and England. Galliot du Pré of Paris used a galley, Myllar of Edinburgh a mill, and Grafton (and other English printers whose names ended in 'ton') a tun (or barrel). Some printers used portraits of themselves, while John Day had a device showing a sleeper being awakened, with the legend "Arise, for it is Day." (It is interesting to compare these old devices with those used by modern publishers—the ship of Longmans, Green, the windmill of Heinemann, the gateway of Methuen, etc. See below.)

In a later chapter we shall give more consideration to the evolution of printing. Our study, however, is of the whole book, and we must interrupt the story of printing and turn our attention for a time to paper.

FIG. 2. THE COLOPHONS OF THREE MODERN PUBLISHERS

William Heinemann, Ltd

Methuen & Co., Ltd

Longmans, Green and Co., Ltd

6

The Coming of Paper

HAVE you ever stopped to think how big a part paper plays in your life? From the time you get up in the morning and look at your morning paper, right through the day and until you go to bed, paper is at your service. If you think about it you will discover that it would be difficult for you to get through a day without paper. And yet if you had lived in England four or five hundred years ago you would probably not have known what paper was; for the invention of paper did not reach Britain until the fifteenth century.

In an earlier chapter we considered some of the materials which were used before paper. We saw how the ancient Egyptians used papyrus, and how in other countries vellum and parchment were the common writing materials. All the early printed books which we discussed in the last chapter were printed on one or other of these two materials. Paper, however, was invented many years before printing, and, as in the case of printing, it is to China that we turn again. Exact historical records are not available, but tradition gives the credit for the invention to Tsai Lun, a craftsman at the court of the Emperor Ho-ti, about A.D. 105.

Before Tsai Lun the Chinese had experimented (as we have seen that other peoples did) with various kinds of writing materials. Easiest to their hands came bamboo. They cut the bamboo into strips nine or ten inches long and wide enough to take a single line of characters. Quantities of these were strung together to form what, for want of a better word, we must call a book. (Perhaps this is why the

Chinese write vertically and not, as we do, horizontally.) But these bamboo 'books' were too unwieldy, and Chinese ingenuity soon turned to a more manageable material. This was a silken fabric, made by pounding up small pieces of silk and silkworm cocoons into a paste and spreading it thinly on to pieces of wood to dry. The resulting fabric was good, but it was very expensive. And so we come to Tsai Lun, who began to make a kind of paper from old rags, old fishing-nets, worn-out sandals, and the bark of trees. Tsai Lun took these unpromising raw materials and pounded them to a pulp with water, using a stone mortar and a wooden pestle. He then spread the pulp on to a board to dry, and was able to peel off the first sheets of paper. At a later stage he boiled his ingredients to a pulp instead of pounding them, and placed heavy weights on the film of pulp to give a harder, firmer sheet.

The next stage in Tsai Lun's work is important, because he hit on the idea which is basically the same as that used in papermaking to-day. Instead of a drying-board he used a coarse sieve made from very loosely woven cloth stretched on a wooden frame. The pulp was put into a vat of water and the sieve dipped into the vat. When it was lifted out the water drained away through the holes in the sieve and left a deposit of fibres on the cloth. When this dried out a sheet of paper could be peeled off. Later on we shall see that even to-day the finest handmade papers are produced in just this way, and that even on the huge modern papermaking machines a kind of sieve is used.

The paper produced on this sieve was a 'wove' paper—that is to say, its texture was like that of a piece of woven material. Tsai Lun was not satisfied with this and went a further step. He made another sieve or mould, this time from narrow strips of bamboo, held together by tiny threads of silk. This gave him a 'laid' paper—that is, the texture of the finished paper consisted of a series of ridges running across the sheet.

Tsai Lun now found that he had need of some kind of sizing. You know that if you try to write on blotting-paper the ink from your pen 'runs,' as we say, but on a piece of writing-paper the ink stays where you put it and does not 'run.' This is because the blotting-paper has no sizing on it (or very little), whereas the writing-paper is sized and the ink only gradually soaks into the paper through the surface scratches made by your pen. On very hard-sized papers, such as those used for ledgers, the ink stays on the surface for a very long time (even after you have blotted it), and if you make a mistake you can easily erase your writing with a sharp knife. Tsai Lun, therefore, produced a size by boiling starch and lichen together in water. There are samples of these early Chinese hard-sized papers in the British Museum, and their quality compares, even now, very well with modern hard-sized paper. In 1904, eighteen hundred years after Tsai Lun made his invention public, Sir Aurel Stein, the great traveller, discovered in one of the ruined towers of the Great Wall of China some letters which were found to have been written on rag paper within fifty years of the date of Tsai Lun's invention.

And so, in far-away China, paper was born. But the invention did not reach Europe until the end of the eighth century. The civilization of the Far East and the civilizations of the Near and Middle East existed side by side, but there was practically no contact between them. Towards the end of the eighth century, however, the Arabs at Samarkand took some Chinese prisoners, from whom they learned a number of things, including the art of making paper. In 793 a factory was working at Baghdad, where the Caliph Haroun al Raschid (whom you will remember from the *Arabian Nights*) had introduced Chinese labourers. The invention then moved on to Damascus, which became the main source of such supplies as reached Europe for several centuries. It was famous for a kind of paper known as Charta Damascena. From Damascus the art travelled to Egypt, where in the

ninth century paper gradually superseded papyrus, which had been in use for some 3000 years. From Egypt to Morocco, whence, in about the year 1110, the Moors carried it across to Spain. Not only did the Moors introduce paper into Europe; they were the first people to crush the fibrous raw materials by other than human power. In about 1150 they set up a stamping-mill in the town of Xativa. The further spread of the art is most easily seen from the following table, showing the approximate dates when paper was first made in the countries of Europe and in the United States:

France (at Hérault)	1189
Italy (at Fabriano)	1260
Germany (at Nuremberg)	1389
Switzerland (at Marly)	1400
Belgium (at Bruges)	1407
Holland (at Gennep)	1428
Great Britain (at Stevenage)	1490
Sweden (at Motala)	1532
Russia (at Moscow)	1690
U.S.A. (at Germantown, Pennsylvania)	1690
Norway (Oslo)	1698

You must especially note when paper was first made in Britain. John Tate began to make paper at Stevenage, Hertfordshire, in 1490, and it is no exaggeration to say that, although they have been equalled by other nations, British-made papers have from that date been unsurpassed for quality.

We must now return to our study of printing, for the successors of Caxton were contemporary with John Tate, and we shall begin to find printing and papermaking marching hand in hand.

7

The Advance of the Twenty-five Soldiers[1]

WE left our study of printing with the arrival of William Caxton as the first English printer. Caxton died in 1491, leaving us for ever in his debt. He had no son to succeed him, but he had trained assistants, and one of them, Wynkyn de Worde, took over the printing business. Wynkyn was an Alsatian, from Worth, in Alsace, and he became a naturalized Englishman in 1496. Wynkyn was a very industrious printer, but he was not a scholar as Caxton had been. Some of his early books were reprints of books that Caxton had already produced, while others were translations which Caxton had made but had not issued during his lifetime. Wynkyn continued to work from the Sign of the Red Pale in Westminster for some nine years, and had a very flourishing trade. His books were in such great demand that at one time he had to sub-contract some of his work to another printer, Julian Notary, who had recently moved from the City of London to Westminster.

Other printers had started up since Caxton blazed the trail. John Lettou started in the City of London in 1480, and was very soon joined by William de Machlinia, from Mechlin (or Malines), in Belgium, but they had been preceded in 1478 by Theodoric Rood, from Cologne, who set up his press in Oxford. But Wynkyn's chief rival was Richard Pynson, who began printing at the Sign of the George, next to St Dunstan's Church in Fleet Street. He

[1] "With my twenty-five soldiers of lead I will conquer the world," said Gutenberg. What were the twenty-five soldiers?

was appointed the King's Printer, and had the best-appointed printing-office in England. His main output was of law books and official publications, but he did publish also editions of *The Canterbury Tales* and Froissart's *Chronicles*, in a translation by Lord Berners. Pynson is particularly worthy of note because he introduced into England (in 1509) the Roman letter, on which all modern printing types are based. Caxton and his successors worked with what is known as the English 'black letter.'

It was probably the success of Pynson which induced Wynkyn to move from Westminster to London. He also settled in Fleet Street, at the Sign of the Sun, opposite Pynson and near St Bride's Church. The move was a great success. The demand for his books was so great that he had to open a bookshop in St Paul's Churchyard, which was rapidly becoming the centre of the bookselling and stationers' trade. At St Paul's Churchyard Wynkyn adopted the sign Diva Maria Pietatis ("Divine Mary of Pity"). His industry was prodigious: during his lifetime he issued something like 1300 books. He had several noble patrons, including Margaret, Countess of Richmond, mother of Henry VII, a patronage of which he was particularly proud. Pynson was able to call himself "the King's Printer"; Wynkyn was content to be "printer to the King's mother," and even, after the death of Henry VII, "printer to the King's grandmother"!

Although Wynkyn was not the scholar that his master, Caxton, was, he was a very great printer. Some of his books were trivial in the extreme, but his work showed considerable technical advance on Caxton's. His types were better and his illustrations more distinguished. He was the first man to use English paper, paper made by John Tate of Stevenage.

Richard Pynson, the King's Printer, shared with Wynkyn the leadership in printing in England in the early part of the sixteenth century. He issued a large number of legal and religious books, including *Magna Carta* and an edition

of *De Imitatione Christi* (*The Imitation of Christ*) by Thomas à Kempis.

Although Wynkyn and Pynson and their contemporaries were carrying the torch in England, it was on the Continent that the art of printing was reaching its high levels. In several great centres in Europe there were great scholar-printers—Aldus Manutius in Venice, the Estienne Brothers in Paris, Plantin in Antwerp, for example.

Aldus Manutius (1494–1515) was perhaps the greatest of them all. He probably did more than any other single man to forward the spread of learning in Europe. Many a modern publisher might look with envy at his list of books; for he produced, within ten years, first editions of most of the masterpieces of Greek literature—Aristotle, Aristophanes, Aeschylus, Sophocles, Euripides, Pindar, Herodotus, and Demosthenes, a truly formidable list. His most important work, however, was his production of a long series of reprints of the Greek and Latin classics in a small folio edition. These little books, bearing Aldus's familiar anchor device, became widely known, for they marked a great advance in book production. Before Aldus the book had been an object of the library; his series made books handy, personal, and intimate things which the student could carry in his pocket. This change of function in the book inevitably brought a change in the format. The small, pocketable books which Aldus produced could not be printed in the large types which were used for the large folios designed to be read at the lectern; and at the beginning of the sixteenth century he had cut for him a new small type based on the cursive handwriting then current in Italy. This Aldine type was the origin of the sloping type which we now call italic. The Aldine version was much too sloping and was hard to read; later versions, especially those cut by Arrighi, were much more compact and less sloping. Aldus also had cut for him a beautiful upright (or roman) type which was to influence very strongly the future of type-cutting.

While Aldus was at work in Venice there were other great printers at work on the Continent. In Paris Henri Estienne had founded a printing business which was carried on by his family for over 150 years. He too was a scholar, and in his thirty-odd years as a printer he printed over 700 books, including many of the Latin classics. His son, Robert, was to carry this tradition of scholar-printer to such a degree that Latin became the everyday language of his entire household from the highest to the lowest. Robert's *New Testament* of 1550, printed in the new Greek type, cut by Claude Garamond under the patronage of King Francis I, is one of the most beautiful books produced in the sixteenth century.

We have room for only a brief mention of the other great Continental printers of the sixteenth century, such as Sebastian Gryphius, of Lyons, whose predilection for italic types led the Spaniards to call such types by the name 'Grifo'; Christopher Plantin, who made Antwerp world-famous for beautifully printed liturgical books; Louis and Bonaventura Elzevir, of Leiden, whose series of well-printed little books might almost be called the forerunners of the popular reprint series which we know to-day, our modern Everymans and Penguins.

8

The Advance in England

WE have seen that early in the sixteenth century Wynkyn de Worde and Richard Pynson were the leading printers in England, but they and their contemporaries were mainly concerned with producing books for the home market. Law books and religious books were mostly imported from the Continent, as it was found cheaper to do this than to print them in England. Several Continental printers, notably Antoine Vérard of Paris, printed editions especially for England. Vérard, indeed, is credited with being the first publisher, because he not only printed books himself, but also paid other printers to work for him. Occasionally Continental publishers exported less serious works to England, such as Doesborch, of Antwerp, who printed special editions in English of *Tyll Howleglas* and *Robin Hood*. The Continental printers also printed numbers of controversial religious and political books which were smuggled into England and circulated secretly. Coverdale's and Tyndale's translations of the Bible were printed on the Continent and smuggled in in this way.

In 1557 an event of very great importance took place in England. The Stationers' Company in that year was incorporated by royal charter. By the terms of this charter anybody who wished to print anything for sale had to be a member of the Company, and every member had to enter in a register kept by the Company the title of any book or piece of copy that he wished to print and claimed as his property. This charter and the power it conferred on the Company completely regulated the industry, and the

monopoly thus created exerted a profound influence on the production and circulation of books right down to the eighteenth century.

Before 1557 the state of the book trade in England had become chaotic. The authorities had been, on the one hand, anxious to encourage the new art of printing and, on the other, equally anxious to control what was printed and distributed. An Act of 1484, which regulated the trade of foreigners in England, was careful to exempt from its provisions all stationers, scriveners, illuminators, and printers, "no matter of what nation or country he be," and encouraged such men to settle in England and ply their craft. As a result it is estimated that by 1530 about two-thirds of all printers, bookbinders, and stationers in England were foreigners. Feeling against foreign traders, however, ran high among the people, and there were many riots in which foreign traders and apprentices were attacked and manhandled. Even Richard Pynson, most respected of printers, had cause to complain that he and his workmen had been attacked in Fleet Street.

Other Acts in 1523 and 1534 withdrew the exemption of foreign printers from the restraints under which other foreign traders suffered, and attempted to prevent the free importation of books from the Continent. The chief object of the Act of 1534 was more to stop the entry into England of heretical religious books than to protect the English printer, but in the event the result was to make the number of foreign printers dwindle almost to nothing; but the smuggling of foreign books went on as before. Tyndale's New Testament, for instance, had a wide circulation in England through illegal channels although it was prohibited.

When the Stationers' Company was granted its wide powers the authorities, of both Church and State, saw in it an instrument by which the trade could be controlled. Indeed, at the very beginning of Elizabeth I's reign a system of censorship was introduced. An order in council

was made forbidding the printing of any book unless it were first licensed by certain authorities. This order was, however, honoured as much in the breach as in the observance, and in 1586 the Star Chamber issued a very severe decree regulating the Press. This gave the authorities power to control printing, but it was not very successful in preventing the distribution of seditious and heretical books, many of them printed abroad and smuggled into the country.

The effect of the Stationers' Company's new powers under their charter was striking. Before the charter there were presses at Oxford and Cambridge, St Albans, York, Tavistock, Abingdon, Ipswich, Worcester, and Canterbury. By 1557 all these presses were extinct, and there was practically no printing done outside London, until the press was revived at Cambridge University in 1583. Oxford University Press was revived two years later. By 1586 there were just over fifty presses, and the decree of that year forbade any increase in their number.[1] The production of printed matter, therefore, was limited to the capacity of the existing presses. In spite of this, however, printing output managed to keep pace with the tremendous literary outpouring of the Elizabethan age. Poems, plays, translations, books of travel, books on philosophy and theology, Bibles, prayer books, school primers poured forth and made the age of Elizabeth I and James I a great one not only for the number and merit of the books written, but also for the number and quality of those printed.

It is, however, a little disconcerting to recollect that the plays of Shakespeare and his fellow-dramatists were published and sold, not by the best printers of the time, but by obscure little men. The quartos in which the greatest works of the greatest age of English literature first saw the light were ill-printed and ill-bound, and were produced by men like

[1] Even as late as 1688, when William of Orange reached Exeter, he was unable to find a single printer or printing-press to print his manifesto!

Edward White, a dealer in ballads, James Roberts, an almanac publisher, and John Danter, who was an unscrupulous pirate, for such books were considered beneath the notice of the pedigree printer.

The regulations controlling printing have already been referred to. In the reign of Charles I these regulations were made more stringent, but, as was to be expected, after the Civil War they were abolished along with the Star Chamber, the controlling authority. One would have imagined that a free Press would have been to the liking of the Parliamentarians, but they found it inconvenient. They had fought the Civil War in defence of liberty, but very soon began to reimpose restrictions on the printed word. John Milton was moved to protest in his book *Areopagitica*, but censorship went on.

With the Restoration there came no lessening of restrictions. The Cavalier Parliament passed the first Licensing Act in 1663. It was intended to suppress seditious and heretical writings, particularly, of course, the work of Puritans. Every work had to be licensed before publication. Political works had to be licensed by the Secretary of State, law books by the Lord Chancellor, books on heraldry by the Earl Marshal or the King-at-Arms, and all others by the Archbishop of Canterbury and the Bishop of London. The ecclesiastical licensers forbade the publication of specifically dissenting literature, but were not so bigoted as to ban *Paradise Lost* or *The Pilgrim's Progress*. Men of letters and men of science fared much better than political and religious writers. Walton's *The Compleat Angler* appeared in 1653, Dryden's *Absalom and Achitophel* in 1681, and Congreve's *Love for Love* in 1695. Sir Isaac Newton's famous treatise *Philosophiae Naturalis Principia Mathematica* appeared in 1686, bearing the *imprimatur* of Samuel Pepys, as President of the Royal Society.

The Licensing Act was renewed at intervals until 1695, when it was finally abolished, thus bringing true Milton's

dream of the "liberty of unlicensed printing" which he had described in his *Areopagitica*.

The abolition of licensing, however, did not by any means give the Press complete freedom. A heavy stamp duty on printed matter and a very ill-defined law of libel continued to fetter author and printer alike. Writers, too, were controlled by laws forbidding seditious and obscene matter, as, indeed, they are to this day.

In the eighteenth century a famous case was fought out in the courts which finally established the freedom of the Press in Great Britain. John Wilkes, a man of considerable ability and wit, but of low moral character, attacked the Government of the Earl of Bute in a publication called the *North Briton*. In 1763 he was indicted for libel, but the Court of Common Pleas held that his arrest was illegal and that he was protected by Parliamentary privilege. The House of Commons then passed a resolution declaring that No. 45 of the *North Briton* was a seditious libel and that the privilege of Parliament did not cover such publication. Wilkes left the country and, in his absence, was declared an outlaw. In 1768 he returned to England and was elected M.P. for Middlesex. He was not allowed to take his seat, however, and, having surrendered to his outlawry, was sentenced to twenty-two months' imprisonment. In 1769 he was re-elected to Parliament, but once more his election was declared void. In 1774, when the electors of Middlesex again returned him, he was allowed to take his seat. He became Lord Mayor of London, and the resolutions against him were expunged from the records of the House of Commons. This case and Fox's Libel Act of 1792, which transferred from the judge to the jury in a court of law the responsibility of determining a libel, to all intents and purposes settled the issue. Governments tended to rely more and more on presenting their own case in rival publications rather than on suppressing those of their opponents, and the freedom of the Press in Great Britain has scarcely ever been challenged

since. Even during the First and Second World Wars there was no censorship of the Press, although, of course, editors and writers were voluntarily restrained by Defence Regulations, designed to prevent the enemy from gaining information which might be useful to him.

Until the eighteenth century books, by and large, had been the privilege of the few. Now, however, the habit of reading was spreading to a much wider public. In 1709 Sir Richard Steele started *The Tatler*, which appeared three times weekly until 1711. It was succeeded by *The Spectator*, which appeared daily from March 1, 1711, until December 6, 1712. This was conducted by Steele and Joseph Addison, who had collaborated with Steele in *The Tatler*. It was revived by Addison in 1714, when it ran for eighty numbers, and had a circulation of many thousands. In 1731 Edward Cave launched *The Gentleman's Magazine*, which lasted until 1914. The novel too began to make its appearance. *Robinson Crusoe* appeared in 1719, *Gulliver's Travels* in 1726, *Pamela* by Samuel Richardson in 1740–41, and Henry Fielding's *Joseph Andrews* in 1742. These were followed by Richardson's *Clarissa Harlowe*, *Roderick Random* by Tobias Smollett, and Fielding's *Tom Jones*. The plays of Shakespeare, which hitherto had been obtainable only in the four great folio editions, appeared in some twenty smaller and more popular editions. Historians like Gibbon and Hume and other serious writers obtained large circulations for their books. John Newbery, an energetic publisher in St Paul's Churchyard, who figures in Oliver Goldsmith's *Vicar of Wakefield*, became the first publisher of popular children's books, among them *Goody Two Shoes*. Jacob Tonson, who had purchased the copyright of Milton's *Paradise Lost*, published many works by John Dryden and an edition of Beaumont and Fletcher; Barnaby Bernard Lintot poems and plays by Pope, Gay, Steele, and others; Robert Dodsley works by himself and by Dr Johnson, Goldsmith, and Gray; and Andrew Millar Dr Johnson's famous *Dictionary*.

The question of copyright became an issue at the beginning of the century. It had always been assumed in common law that the ownership of the copyright in unpublished manuscripts, including letters, rested with the author. Copyright in printed literary works, however, had to be secured by some legal process. In early times protection was secured either by a royal grant of privilege or else by registration with the Stationers' Company. The Stationers' Company (see page 49) protected the rights of its members by imposing fines and other penalties for infringement. It must be noted that the protection of the Company was afforded to the publisher and not to the author, regardless of whether the publisher's title was good or not. The author often had little protection, as witness the piracy of plays which went on in the reign of Elizabeth I. By the Copyright Act of 1709, however, the rights of the author were established. The author (or his assigns) was given the sole right in his book for a period of fourteen years, renewable for a further fourteen years if the author was alive at the end of the first term. The Act did not make clear whether it affected perpetual copyrights granted before 1709—*e.g.*, Jacob Tonson's ownership of *Paradise Lost*. This question was disputed throughout the eighteenth century, and was finally settled against the publishers.

To conclude the story of copyright, it is necessary to add that in 1814 the period of author's copyright was increased to twenty-eight years or the term of his life. In 1842, thanks to Macaulay's activity, the period was further increased to forty-two years, or seven years after the author's death, whichever was the longer. The Copyright Act of 1911 repealed most of the earlier statutes and codified British, and in general Imperial, copyright law. In 1956 a new Copyright Act and a new International Convention were brought in. Copyright subsists automatically in every original literary, dramatic, musical, and artistic work, and continues

to subsist for fifty years after the death of the author, and then expires. Most of the nations of the world subscribe to the International Copyright Convention, the U.S.S.R. and the People's Republic of China being the outstanding exceptions.

9

The Weaving of the Web

WHEN we last looked at the development of papermaking we noted that paper was first made in Britain by John Tate, of Stevenage. In 1588 Sir John Spielman was operating a paper-mill at Dartford, in Kent. By the middle of the seventeenth century there were other small mills in Scotland and in Staffordshire, Buckinghamshire, Oxfordshire, and Surrey. But none of them was very successful, one reason being the common belief that the use of old rags helped to spread the plague. After the revocation of the Edict of Nantes in 1685 there was a huge influx of Huguenots from France, many of them skilled papermakers. One of the results was the opening in 1724 of a mill at Whitchurch, in Hampshire, for the manufacture of watermarked paper for the Bank of England, a mill which, incidentally, is still operating.

About the middle of the eighteenth century there was an invention which marked a distinct advance in papermaking. This was the rag-engine or hollander, as it was called, a machine for the rendering of rags into pulp. About the same time, also, John Baskerville, of Birmingham, a printer and stationer, introduced the wove mould into papermaking.[1] Previously the wires in the mould were straight, giving the characteristic 'laid' marks, visible both on the surface and when the sheet is held up to the light. These laid marks gave trouble to the printer, making it difficult for him to get an even impression. Baskerville suggested the use of a

[1] A curious reversal of the Chinese discoveries (see page 42). Tsai Lun began with a *wove* mould and progressed to a *laid* mould.

woven fabric instead of the straight wires. The result was the wove paper with which we are all familiar.

The effects of the Industrial Revolution, in the second half of the nineteenth century, on the paper trade were twofold. The increase in the population and the consequent great expansion of the textile trades meant that there was a great increase in the supply of rags, raw material of papermaking. But the same factors, the increase of population and the expansion of business, meant a greatly increased demand for paper, for business cannot get along without it. In addition, it was a literary age; more books were read, more letters were written, and newspapers made great strides—all needing paper. These factors caused a shortage of paper and set men to thinking how paper could be made from other substances and materials which were more plentiful than rags.

In 1719 the great scientist Réaumur suggested that paper might be made from wood, and in 1765 Dr Jacob Schäffer, a philosopher and divine, described experiments in making paper from a miscellaneous collection of materials, ranging from wasps' nests and cabbage-stalks to sawdust and straw. In 1800 Matthias Koops published a book on papermaking which was printed on paper made from straw and wood. It was not very good paper, but it *was* paper. The trouble was the colour; no satisfactory method of bleaching had been discovered. In 1774 Scheele discovered chlorine, and five years later Tennant invented bleaching-powder, and white papers could be produced from discoloured materials. These were not very good papers, for they deteriorated under the effects of the bleaching agents, and it was some years before chemists discovered how pulps could be bleached without detriment to the paper itself.

At the end of the eighteenth century there were several hundred paper-mills in the British Isles, but all the paper was made by hand, despite many attempts to invent a papermaking machine. An outstanding attempt was that

made in 1799 by Louis Robert, a clerk in the paper-mill of Didot Frères, at Essonnes, in France. He could get no encouragement in his own country and brought his invention to England, where it was taken up by a firm of stationers, Fourdrinier Bros. They engaged an engineer, Bryan Donkin,

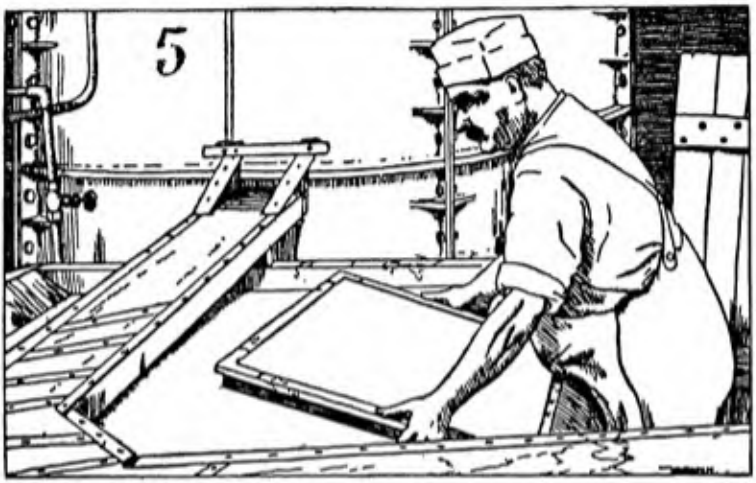


FIG. 3. HANDMADE-PAPER MAKING

The vatman is about to immerse his mould in the vat of pulp and water.

to work on Robert's idea, and in 1803 a machine was set up at Frogmore, in Hertfordshire. The machine cost so much to make that it is said that the Fourdriniers lost a fortune, but their name will always be associated with the greatest of all advances in papermaking. Fig. 5 shows a model of the Fourdrinier machine which can be seen in the Science Museum at South Kensington, in London. The paper was formed on an endless wire cloth, pressed on a felt, and reeled up in a wet state. It was then unreeled, cut into sheets, and dried in a loft, as the handmade paper was dried. The firm of Fourdrinier failed in 1808, but the

machine was a success. In 1830 half the paper made in England was made on it.

In 1809 John Dickinson, the founder of the firm which still flourishes in Hertfordshire, patented another type of machine. In this machine the paper was formed upon a wire-cloth-covered cylinder, which revolved in a suspension of pulp, the filtered water being drawn off from inside the cylinder. The layer of pulp was removed from the surface of the cylinder by means of a felt-covered roller. The modern cylinder or vat machine owns Dickinson's machine as its parent.

Both these machines produced paper in a wet state which had to be dried after removal from the machine, but in 1821 T. B. Crompton invented a method of drying the paper in a continuous roll. Before 1806 all paper had to be sized by being dipped into a vat after it was made, but in that year a German named Illig discovered that rosin, added to the pulp, rendered an extra sizing process unnecessary. The method of dipping, known as tub-sizing, is still used for high-quality papers where strength and a very hard surface are required; the other method, known as engine-sizing, is used for the vast majority of papers where cheapness is more important than strength.

We have now brought the story of papermaking down to modern times. The coming of steam power and, later, electric power speeded up production, and there have been, as we shall see in a later chapter, many improvements and refinements in the art of papermaking. Bigger machines, coating processes, twin-wire methods, have played their part, but the pioneers who have been mentioned in this chapter established the modern art, and their inventions and discoveries are the foundations on which the great papermaking industry of to-day has been built.

10

Printing in the Nineteenth Century

IN the nineteenth century the printing industry made great strides, although there are few great names to be mentioned. The industry expanded beyond all that the early exponents could possibly have imagined, but there were few advances in the printer's art. In fact, for a time there was a definite decline. Up to the beginning of the nineteenth century printing was almost entirely confined to books, but soon after the turn of the century the great increase in newspaper production and the rise of the jobbing printer made considerable difference to the way printing was to develop. The early newspaper printer was, in the main, interested only in cheapness and not in quality of printing; the jobbing printer, armed with a new set of ornamental types, designed by Robert Thorne and other typefounders, went in for experimentation in a big way. In Fig. 4 are reproduced some of the ugly types which became popular for nineteenth-century job-printing. Most of these have died a violent death, although a few still survive to this day in the type-racks of small and unprogressive printers. A new 'modern' style of types also made its appearance and achieved tremendous popularity. Baskerville, in Britain, had been the pioneer of these modern faces, and Bodoni and Didot on the Continent. These new types had their good points, but the contrast between their thick and thin strokes tends to be tiring, and their severe appearance palls after much repetition. (See Appendix 1.)

If the nineteenth century lacked artistic advance in printing it certainly had plenty of technical progress to show.

The coming of steam power was bound to have its effect on the printing industry. In 1912 came Koenig's invention of the cylinder printing-machine. It was immediately taken up by *The Times* newspaper, and before long its output had been stepped up from 250 to 1000 impressions per hour. In 1865 a machine was invented for printing on continuous rolls of paper, and a few years later the proprietors of *The Times* patented the Walter press, which had an hourly output of 15,000 copies of the complete newspaper. Such a feat would have been impossible without the invention of Louis Robert (see page 59) and John Dickinson (see page 60) in papermaking and the invention of the process of stereotyping by William Ged, an Edinburgh goldsmith, in 1727.

Stereotyping needs to be explained. In this process damp papier-maché[1] is pressed and beaten on to the face of the pages of type, and the type leaves an impression on the papier-maché. This mould is then baked hard and molten metal poured into it. When the metal solidifies it forms into a solid plate, exactly reproducing the original type. The metal used for these stereoplates is much harder than type metal because it is bonded together, and for this reason many more impressions can be taken from a stereoplate than from type. Ged, however, produced only a flat plate, and his invention was largely ignored until Lord Stanhope revived it at the beginning of the nineteenth century. A method was discovered of bending the mould, so producing a curved plate which could be clamped to a cylinder. Without it Walter's press, mentioned above, would have been impossible.

All these technical advances were of great service to the rapidly expanding newspaper and periodical industry, for they all tended towards cheap mass-production. But they were accompanied, alas! by a serious deterioration in the art of printing. There were some good-looking series of

[1] In recent years plastics have been introduced, and in many foundries have replaced both papier-maché and metal.

cheap reprints, such as Murray's "Family Library," Bentley's "Standard Novels," and Constable's "Miscellany," but there was little that was distinguished from the typographical point of view.

FIG. 4. SOME UGLY VICTORIAN TYPEFACES—NOT ALL, ALAS, YET DEAD

The 'three-decker' novels and the publication of the novels of Dickens, Trollope, Thackeray, Harrison Ainsworth, Lever, and Surtees in monthly parts did nothing to improve the standard of production. There were experiments, but they were distinguished more for their originality than their

good taste. There was some revolt against the inevitable modern-face type in a revival of the Caslon letter, but this was spoilt by the addition of ornamental borders, flourishes, and tailpieces in the worst possible taste.

Such was the situation when William Morris set up the Kelmscott Press at Hammersmith in 1890. He had already helped to found and maintain the manufacturing and decorating firm of Morris, Marshall, Faulkner and Co., in which his fellow-artists Rossetti, Burne-Jones, Madox Brown, and Philip Webb were his partners. This firm had brought about a revolution in the taste of the English public in matters of decoration and furnishings. Now this painter-poet turned his attention to the task of rescuing English printing from the unimaginative dreariness into which it had fallen. He had as his collaborator Emery Walker, and together they produced in the next seven years fifty-three books of outstanding merit.

For his work Morris went back to the earliest printers and, inspired by their work, designed his own typefaces. Burne-Jones and other artists assisted by providing decorative borders and illuminated initials, designed to blend with the new types into one harmonious whole. The Kelmscott books were without exception beautifully printed on handmade paper, and either bound in vellum or quarter-bound in blue-papered boards with linen backs. Each edition was limited to a few hundred copies, and to-day Kelmscott books are highly prized by collectors. The effects of Morris's work were far-reaching and mostly good. But not all. His types were designed to appeal to the eye, without much regard for the cardinal virtue of legibility, and by his emphasis on hand-work he tended to retard rather than to advance the work of the men who were struggling to make something beyond the purely mechanical with the new printing machinery.

Many private presses sprang up, fired by Morris's example, among them the Doves Press, the Essex House Press, and

the Ashendene Press. The Doves *Bible*, the Kelmscott *Chaucer*, and the Ashendene *Dante* are generally held to be among the most beautiful books ever produced. Morris was the pioneer; the later presses sought to emulate him, without copying him. Morris tended to elaboration, the Doves Press to austerity. Modern printers have followed a middle way between the two. To-day the efforts of such organizations as the Folio Society and the Nonesuch Press carry on the tradition, but they have not to do the pioneering work which Morris undertook. There are now many large commercial book-printers who maintain a standard of design and presswork, produced by high-speed machinery, which would have gladdened the hearts of Caxton and William Morris alike.

To complete this chapter we must mention the developments which took place in the New World. There De Vinne, Gillis, and Updike were working to bring about a revival in the United States. Updike founded the Merrymount Press in 1893, and much of his early work shows the influence of Morris; but he was soon branching out on his own original lines. The work of these American printers has been carried on by Bruce Rogers at the Riverside Press. Rogers's influence on modern typography and book-design has probably been greater than that of any other one man. We shall have more to say of him in a later chapter.

Part Two : The Modern Book

11

The Publisher

UP to this point we have been considering the origin and history of the making of books. In this section we shall consider a modern book—how it is produced, published, and distributed. And first of all we take a look at the publisher, because he is the link between the author and the reader. We shall use the term 'publisher' to include every one in the publisher's office, for we have not the space to deal individually with the editor, the production manager, the advertising manager, the sales manager, the export manager, the head warehouseman, and all the rest.

Sir Stanley Unwin, the doyen of modern publishers, has said: "Publishers are much abused people. It is doubtful whether, in proportion to their numbers, any other class comes in for quite so much criticism, or has so much publicity given to its every shortcoming."[1] Lord Byron, who had reason to be as thankful to his publisher as any man, is credited with the saying, "Now Barabbas was a publisher," and we have all heard stories of Milton's *Paradise Lost* being sold to the publisher for £10, of Chatterton dying in a garret, of struggling authors and wealthy publishers. Yet it could with justification be claimed that no enterprise, with the possible exception of the theatre, is so fraught with risk as is publishing. The publisher takes all the risk, he employs authors, artists, papermakers, printers, and binders, and he so often has the mortifying experience of seeing the book on which he has lavished so much thought and care spurned

[1] *The Truth about Publishing* (Allen and Unwin).

by bookseller and public alike. Why, then, does he follow such a trade? Well, it has its compensations; like the theatre, it *can* offer spectacular success; it always offers excitement; and its history gives the publisher the satisfaction of knowing that he follows, however humbly, in the footsteps of Coverdale and Tyndale, and Milton, and all those who have sought through the published word to give men freedom of thought and spiritual nourishment.

It is a commonly held fallacy that a publisher sits in a palatial office and waits for fawning authors to bring him the manuscripts of certain best-sellers. There is no such thing as a ready-made best-seller. George Stevens, an American, has said: "There's one of these stories that run around the trade to the effect that all books on Lincoln sell, all books about dogs sell, and all books by doctors sell—so the man who writes a book about Lincoln's Doctor's Dog is going to clean up."[1] He goes on to quote the example of *Ferdinand*, by Munro Leaf and Robert Lawson. This slim volume about the little bull who preferred smelling flowers to fighting toreadors was published in the U.S.A. in September 1936. The advance sales—*i.e.*, those orders placed by booksellers before publication—totalled 1457. By Christmas 14,000 had been sold. In 1937, 68,000 were sold, and the sales for the first six months of 1938 amounted to 145,000. Brilliant though this little book may be, no publisher would have dared forecast a quarter of a million sale in two years. Similar stories could be told of other books which became best-sellers—*When We Were Very Young*, *Gone With the Wind*, *Tarzan of the Apes*, *Parkinson's Law*, to name but a few. Why is this? Why does one book fail and another soar to dizzy heights of best-sellerdom? The man who finds the answer to this question is going to be the most successful publisher of all time.

What, in fact, does the publisher do? The first hurdle he must clear is deciding what books to publish. No publisher

[1] *Best Sellers*, George Stevens and Stanley Unwin.

can afford to sit around waiting for manuscripts to come in. Plenty will come. Somebody once said that in every person's life there was the material for one book, and the average publisher has cause sometimes to think that almost everybody has decided to commit that material to paper! Of the manuscripts that come in unsolicited not one in a hundred is publishable; but, no matter how expert he becomes in the art of assessing manuscripts quickly, the publisher *must* spend *some* time on every one if he is not to miss the hundredth. But he must also be constantly on the look-out for the 'long-felt want,' and then try to find the writer to fill it. He must watch trends in the public's reading taste, for even a good book may fail if it is published at the wrong time. An example of comparative failure of this sort springs to mind. After the First World War, A. P. (now Sir Alan) Herbert wrote *The Secret Battle*, considered by eminent critics (including Sir Winston Churchill) to be one of the best of all war novels. But, as it turned out, the fashion for war books had not yet begun, and the sales were small. Very soon after came *All Quiet on the Western Front*, *The Case of Sergeant Grischa*, and many more, until it seemed that any book with a war theme was bound to be a best-seller. It was not, however, until A. P. Herbert had made a name for himself in other ways that *The Secret Battle* achieved something approaching its true recognition.

The foregoing must suffice to show that, in choosing books to publish, the publisher is faced with problems of a most complex nature, and in the last resort it is his own judgment that he must back.

Let us suppose that our publisher has decided on a manuscript which he wants to publish. An agreement must be made with the author, setting out the remuneration he is to receive from the sales of the book. This agreement may be negotiated either direct with the author or through a literary agent. The agreement will lay down the scale of royalties to be paid by the publisher, or, in certain cases,

the size of an outright payment for the complete copyright. In many instances the publisher will agree to pay an advance on account of the royalties which it is hoped will some day become due. Thirty years ago these negotiations were fairly simple; to-day the market has become highly competitive, and at times a good deal of bargaining may take place before terms are agreed, especially on the vexed question of subsidiary rights—*i.e.*, rights which are created by the publication in book form: film rights, broadcasting and television rights, translation rights, serial rights, Book Club rights, and so on. Into the merits of publishers' and authors' individual cases we cannot go here. Let it suffice to say that the Society of Authors claim that many of these rights should belong exclusively to the author, while the publisher contends that, as without publication of the book these rights would not exist, he is entitled to share in the proceeds from them.

We will leave that controversy unresolved and assume that an agreement acceptable to both sides is signed. The publisher must now get to work on the manuscript. If he is a careful publisher he will probably have suggestions to make to the author for minor changes which will improve the text. In these days, too, he will read the manuscript very carefully to make sure that it contains no passages which might be the basis for an action for libel or obscene libel or which might otherwise prove objectionable. When these points have been cleared up the publisher will have to settle two matters: (*a*) the price, approximately, at which he will publish the book, and (*b*) the size he visualizes the finished product will be. The two questions are often closely connected, of course, but both are to some extent bound by convention. If the book is a novel the price must be somewhere in the 10*s.* 6*d.* to 18*s.* price range, according to length; if the book is a travel book or a biography the price may range from 15*s.* to 30*s.* or even more. Sometimes the book is a short, topical work, which must be published as cheaply as possible.

If the book is a novel it is almost certain that it will be *crown octavo* (7½ in. × 5 in.) or a little larger[1]; a travel book or a biography will generally be *demy octavo* (8¾ in. × 5⅝ in.); a play or a book of poems may be almost any size from *demy sixteenmo* (5⅝ in. × 4⅜ in.) to demy octavo. There is an optimum ratio between cost and price which the publisher would like always to observe, but the conventions mentioned above, and consideration of potential sales figures and so on, often force him to accept a less favourable ratio. If he sets the published price at the economic figure he may successfully discourage people from buying, so he feels he had better go for a lower price and hope to recoup himself by larger sales.

A word or two about the economics of publishing will not be out of place here. A great deal of misunderstanding frequently exists in the mind of the public about the profits of publishing and authorship. Let us take a fairly typical second novel by a writer whose first book sold sufficiently well to encourage the publisher to proceed with the second. It is quite probable that the publisher made no *net* profit out of that first book, but the sales were probably sufficient to make any loss negligible.

Book No. 2 arrives, and appears to be some 70,000 words in length. The publisher decides it will make a book of 224 pages in length, to sell at 12*s.* 6*d.* The cost of 5000 copies will be about £800 and the receipts from sales about £1700; and a simple deduction shows that there is a *gross* profit of £900. But no allowance has been made for advertising, which might amount to anything up to £200; and the publisher's overheads will be not less than 25 per cent., and may be as much as 40 per cent. Then there is the author's royalty, which, at 10 per cent. of the published price, would represent over £300. This reduces the profit to something under £150. But all this arithmetic is based on

[1] The size of fiction is largely dictated by the height of the shelves in the circulating libraries!

the assumption that the publisher sells out the *whole* edition; if he has 1500 left on his hands his profit is gone; and he is a very happy publisher indeed who sells out the whole edition of every book he publishes.

From the foregoing it will be seen that a publisher's lot is not a simple life of proceeding quickly from one success to another!

We shall return to the publisher's problems in Chapter 17 when we consider the distribution of books. But first we must look at the making of a book, considering in turn modern methods of papermaking, printing, and binding.

12

Paper

IN an earlier chapter we noted how Fourdrinier Bros. perfected a machine to make a continuous roll of paper. The principle of that machine still stands as the principle governing the great machines of to-day. The advance has been in size and speed of machine and in the perfecting of texture and finish.

This is not the place to go into the technical details of papermaking materials. It is sufficient for our purpose to note the main materials which are commonly used. In book papers, as distinct from fine writings, ledger papers, browns and Krafts, and other papers for special purposes, the main ingredients are esparto grass, wood-pulp, straw, and rags. But a word or two about each is desirable.

The qualities desirable in papers on which books are to be printed are colour, opacity, strength, bulking properties, and suitability of surface. Generally speaking, although individual taste may incline towards varying degrees of creaminess, a permanent white colour is the first essential, since for ease of reading this gives the greatest contrast with black ink, and, as books are bought to be kept after reading, it is highly desirable that the paper should retain its colour indefinitely. It is obvious, too, that paper which is to carry printing on both sides should be as opaque as possible, and that, when bound into a book, it should be durable and not likely to tear in use. The necessity of bulk may not be immediately apparent. In the years between the wars there grew up what many believe to be an entirely mistaken idea that the public demanded 'bulk.' A 7*s.* 6*d.* novel had to be

1¼ inches thick or the libraries would not take it; a children's book priced at 5*s*. had to look 'big,' no matter what was inside it. As books varied in length, this meant that a book of 160 pages often had to be printed on paper twice as thick as that used for a book of 320 pages. Assuming that the paper used for the 320-page book was of a reasonable substance and pleasant to handle, it followed that the shorter book was printed on unpleasantly thick paper—'blotting-paper,' as it came to be called. The Second World War put an end to the craze, but, alas! the return to peace brought a return in some measure to what all book-lovers must surely feel is an evil practice. But, there it is; so bulking properties in book papers are important. Suitability of surface merely means that the paper used in a book should be efficient. A rough paper is unsuitable for a book containing delicate line drawings; a highly glazed surface undesirable in, say, a book of poems, and so on. In the cheaper types of books, moreover, the question of cost is important.

Let us see now how the aforementioned ingredients supply, or help to supply, these qualities. Rags (largely cotton and linen trimmings) supply the strength. An all-rag paper, such as is used for high-grade ledgers, is immensely strong. Rags also give a fine white colour. They are, however, very expensive, and only small quantities are used in the manufacture of 'utility' book papers.

Esparto grass was first introduced into Britain in 1861, and since then its use has increased steadily. It grows in great profusion in Southern Spain and North Africa. Owing to the very hot climate and to minimize the loss of moisture, the blade of the grass curls and forms itself into a thin tube. It is very wiry and tough, and is gathered by pulling, not cutting. The fibres in esparto are short and therefore do not give much strength, but they do give considerable bulk and opacity.

Wood-pulp, in one form or another, is the most widely used of all papermaking materials. The woods most generally

used for pulping are spruce and pine, although some deciduous trees are also used. There are two distinct kinds of wood-pulp, chemical pulp and mechanical pulp. Mechanical pulp is obtained by grinding logs on a grindstone under a stream of water; in chemical pulp the substances which bind the wood fibres together are broken down and dissolved away by chemical action. The mechanical action tends to splinter and damage the fibres, with the result that mechanical wood makes a poor-quality paper, of inferior colour and little strength. It is largely used in the manufacture of newsprint. Chemical wood, however, retains its fibres intact, and can be used for the making of paper of considerable strength and reasonable opacity. It is of low bulking quality compared with esparto, but gives a good white colour.

During the Second World War esparto grass became practically unobtainable, for the shipping space could not be spared for what was classed as a comparatively inessential import. Papermakers were therefore forced to turn to other, home-produced materials. Vast quantities of straw were used, eked out with almost equally vast quantities of salvaged paper and board. Straw is a fairly good substitute for esparto, but it has several drawbacks. It is very tough and requires much greater care and a longer time in 'cooking' and beating. Its yield per ton of raw material, too, is much lower than that of esparto. It is also less bulky and is more suitable for making hard writing, bank, and bond papers than the softer, kinder papers required for books.

It should be said here, of course, that none of these materials is used by itself. An 'esparto' paper, for instance, will contain some chemical wood-pulp, possibly a little rag, and even some straw. In addition, all papers contain chemicals and minerals, such as resin (which helps the mixture to hold together), cobalt or ultramarine (to increase whiteness), or titanium (which increases opacity).

When Mrs Beeton had assembled her ingredients she always headed her next paragraph "Method." Let us take a leaf from her book and, after this brief survey of raw materials, take a look at the method of papermaking.

We saw in an earlier chapter how the very earliest papermakers had discovered that if a mixture of pulp and water were spread on a sieve the water would drain away and leave a deposit which, when dry, could be peeled off as a sheet of paper. Modern handmade paper is still made in precisely that way, and machine-made paper is produced on a machine which uses the same principle to produce paper on a continuous roll. As we are talking of books, we do not need to spend much time on handmade paper, for such paper is used only for expensive and luxury editions. But it is interesting to compare the processes of making paper by hand with those employed in the huge paper-mill.

The raw material of handmade paper is always rags, cotton, linen or hemp, or, if you like, shirt cuttings, muslin curtains, sailcloth, and old rope! For all such discarded materials are used. For printing-paper cotton and linen are used together. The rags are carefully hand-picked so as to exclude foreign bodies and, in the case of old material, rags which have been attacked by chemical action. The rags are then boiled and broken down in a *breaker*, or *potcher*; this process removes dirt and dye and at the same time completely separates the fibres without unduly cutting them. The resulting pulp is then bleached by further boiling with caustic soda.

The bleached pulp is emptied into a *stuff chest*, from which it is pumped through various strainers into the *vat*. This is a rectangular tank from 6 to 8 feet long, by 4 feet wide, and 3 feet deep, fitted with an agitator, called a *hog*. The moulds are made in pairs, of mahogany or other hard wood which will stand up to alternate wetting and drying, and covered with wire—either straight wires (to give a *laid* finish) or woven wire fabric (to give a *wove* finish). If a

watermark is required a wire device is sewn into the middle of the mould. Each pair of moulds has a *deckle*, a wooden frame, about 1¼ inches wide, which fits over the mould and forms a frame for the sieve.

> The vatman takes the mould with the deckle on it and, holding it vertically with the wire side towards him, dips it into the suspension of pulp, bringing the lower edge towards him until the mould is horizontal and has scooped up rather more than sufficient pulp to form the sheet. As the mould is raised and the water drains away, it is tilted slightly, and the vatman shakes it to and fro, from left to right, so that a 'wave' runs across it from the back (nearest to the vatman) to the front, thus carrying off the excess of stuff. He then shakes it horizontally from back to front, and as there is just sufficient water present to enable the fibres to move, they tend to deposit uniformly and in all directions on the mould. A closer, more regular sheet thus results. The deckle is removed, and the mould with its layer of pulp placed against the *ass* (a curved bracket) to drain. The vatman then places the deckle on his second mould, and proceeds to make the next sheet.
>
> The joint between the deckle and the mould is not sufficiently close to give a clearly defined edge to the sheet, and the few fibres that penetrate the joint form the irregular *deckle-edge* characteristic of hand-made paper.[1]

The sheets thus made now undergo various drying and pressing processes, first between felts, then between zinc sheets, and finally in a drying-loft. The sheets, called at this stage *waterleaf*, are then sized and finished, either by glazing or by hot-pressing. The paper is finally stacked, to mature, and sorted by girls, who throw out any defective sheets, known as *retree*.

In a few sentences we have covered the processes of a

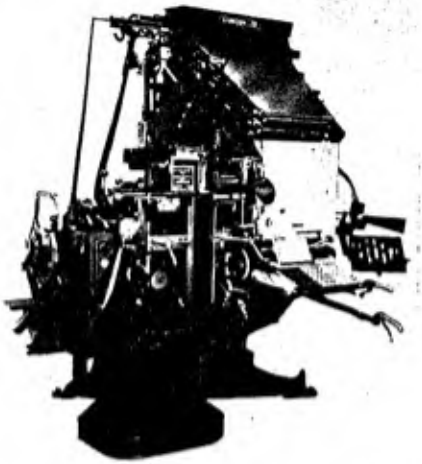
[1] From *Paper Making*, prepared under the direction of the Education Committee of the Technical Section of the British Paper and Board Makers' Association (Inc.).

manufacture which requires the very highest degrees of skill and craftsmanship. Indeed, it is not a misuse of language to talk of the art of papermaking. But the very skills which are put into handmade paper of necessity make it comparatively expensive and therefore unsuitable for the utility book which we use every day. Paper for ordinary books must be made quickly, cheaply, and in vast quantities; and so almost by definition it must be machine-made.

Let us now look at a modern papermaking machine and the processes which are involved. We have discussed the common ingredients. The preparation of these ingredients (speeded up, of course) will be seen to be in fact the same as that done by the handmade-paper maker. The bales of esparto are broken open and passed through a dust-extractor, whence they are fed into giant boilers, where they are boiled for five hours with caustic soda. Repeated washing and bleaching in potchers removes all impurities, and the required proportions of wood, straw, or rag (already pulped) are added to the esparto. The mixture, looking very like coarse porridge, then flows into a beater, where knives break it down still further. Frequent laboratory tests are made on samples of the beaten pulp, until it is declared ready for the machine. Not many years ago the readiness of the pulp was decided by the papermaker, who relied on the 'feel,' taking a handful from the beater for the purpose; but to-day the paper-mill chemist has come more and more to the front, and laboratory control of papermaking has become paramount.

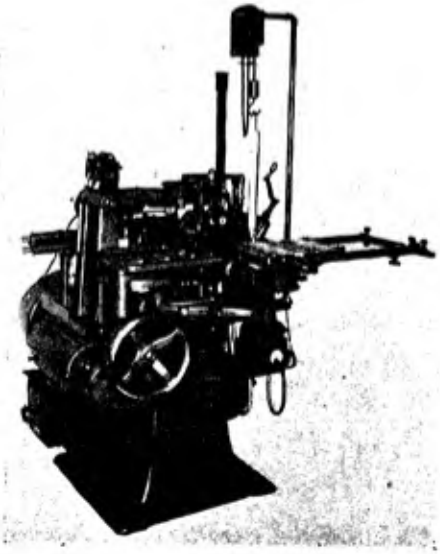
The pulp is now ready to go on to the paper-machine, and we must turn our attention to this gigantic piece of machinery. Fig. 5 shows a paper-machine in section, and reference should continually be made to it during the reading of the following paragraphs. The two halves of the machine are usually referred to as the *wet end* and the *dry end*; the wet end produces the dictionary definition of paper—"a deposit in a sheet of vegetable fibres from

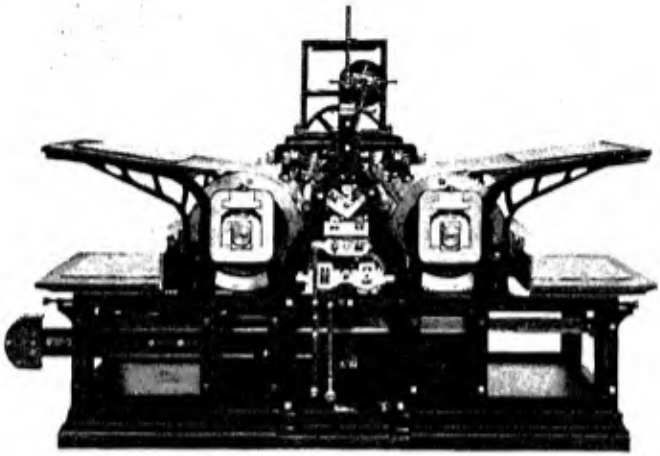
A Linotype Composing Machine
See pp. 89–90.



A Monotype Keyboard
See p. 90.

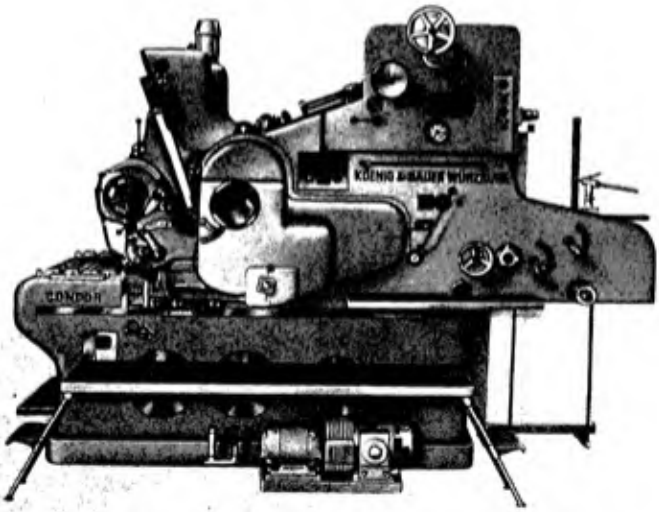
A Monotype Caster
See p. 90.





The Koenig and Bauer Press of 1814

See p. 96.



A Modern Two-revolution Machine made by the Firm of Koenig and Bauer

See p. 97.

aqueous suspension." The dry end turns that sheet into paper which can be handled and converted.

Let us trace the course of the pulp along the machine. The pulp from the beaters passes through a strainer and enters the *breast box*, which is an elaborate levelling tank for controlling the flow of the stuff on the machine. It keeps pulp and water thoroughly mixed and delivers it to the machine in a regular and level stream. The proportion of water to pulp at this stage is roughly 9:1, so that the term 'wet end' is no misnomer. The stuff now passes over the *breast roll* on to the *wire*, an endless wire-cloth made of phosphor-bronze, which carries it from the breast roll to the *couch rolls*. The mesh of the wire varies according to the type of paper being made. For coarse and heavy papers the mesh may be as low as 50 wires to the inch in the weave, while for the finest tissues there may be a triple warp, with a mesh of 65 weft and 195 warp, which is equal to about 90 mesh in a plain weave. The wire runs over the breast roll and then over a series of *tube* or *table rolls*, which vary in diameter from two to twelve inches, and on to *suction* or *vacuum boxes*. The wire is agitated from side to side so as to keep the fibres flowing in one direction, and is flanked by *deckle straps*, which control the width of the web on the wire. All the time, of course, water is seeping away through the mesh of the wire, but when the suction boxes are reached water and air are sucked out of the web. Between the suction boxes is inserted the *dandy roll*, a metal roll covered with wire-cloth. Its purpose is to close up the sheet and give it a clear look-through. If a watermark is to be added to the paper the required design in copper wire is sewn or soldered on the wire-cloth. The *laid lines* for laid papers are inserted in the same manner. Incidentally, every drop of water which is extracted from the web is saved and re-used, for it contains valuable deposits which go into the preparation of further batches of stuff for the machine.

We have now reached the beginning of the dry end. A

firm web of paper is now lying on the wire, and it passes on to the *couch*, which removes the last of the water which can be extracted by suction. A web felt carries the web from the wire to the first press and the process of pressing and drying has begun. The web is still very wet, of course, containing anything up to 66⅔ per cent. of water, so that a good deal of pressing and drying has still to be done. Roughly speaking, for every ton of paper passing through the dryer section of the machine two tons of water have to be extracted.

The drying process begins with a series of *press rolls*, usually three in number, with a set of *nip rolls*, or intermediate *calenders*, just before the last press roll. The nip rolls give the first finish to the paper which is to have an ultimate high finish. From the press rolls the paper next passes through a series of *drying-cylinders*, which are heated by the steam inside them. From the drying cylinders the paper passes through a set of *smoothing rolls* before taking a final drying from further steam-cylinders. Next the paper goes through a stack of calenders, which complete the ordinary finish, on to the *cooling rolls*, and thence to the reel, a completed roll of paper which can be used as it is or subjected to further finishing or converting processes.

The size of the machine? This varies, naturally, in different mills and according to the nature of the paper. An average

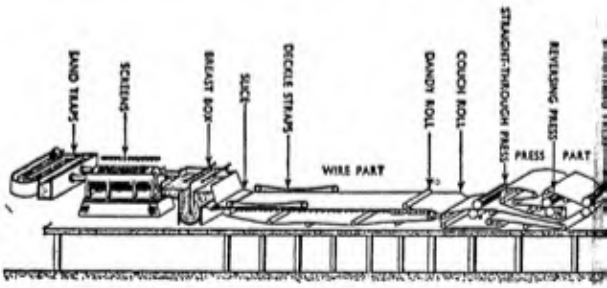
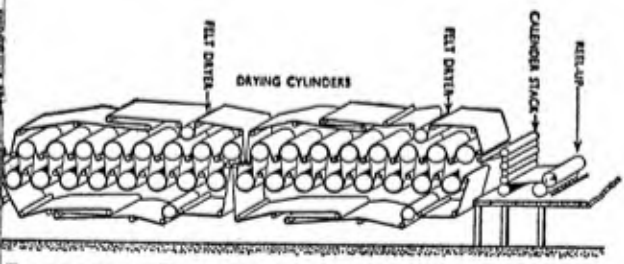


FIG. 5. A TYPICAL

machine making printing-paper will make a sheet varying from 60 to 130 inches wide; a vast machine employed by Bowaters in making newsprint has a wire 324 inches wide. The ordinary machine we have described is about 150 feet long and produces paper at a rate of 250 feet per minute. The giant newsprint machine can produce paper at a rate of 1500 feet per minute. The fuel consumption of a paper-mill is astonishing, no less than ten tons of coal being required to produce one ton of paper.

Has this mechanization eliminated the craftsman from the industry? The engineer, of course, now performs a much larger function in the manufacture of paper, but the paper-maker is still a craftsman. He is often the third or fourth generation of a family in the business, and his experienced eye and fingers remain and, we may hope, will always remain indispensable aids to the engineer and the paper-mill chemist.

We noted earlier that for special purposes paper has to be specially finished or converted by additional processes. For instance, fine line drawings and reproductions of photographs require papers with smoother surfaces than plain type; reproductions of radiographs (photographs taken by X-ray photography) require paper of a higher finish than those depicting some soft landscape. Some of the paper,



FOURDRINIER PAPER-MACHINE

therefore, which comes off the paper-machine does not leave the mill until it has passed through other departments.

Apart from antique papers (the ordinary rough-surfaced paper which you are accustomed to find in a novel or a biography), the commonest form of printing-paper is called *machine-finished-printing* (M. F. printing), its name correctly denoting that it is not subjected to any finishing process after it leaves the paper-machine. Such paper will take line blocks and very coarse half-tones, but very fine work and finer half-tone work require a harder, smoother surface.

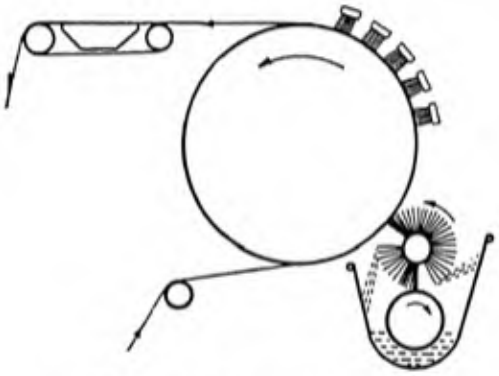


FIG. 6. A COATING-MACHINE

The diagram shows the application of coating to paper by a rotating brush.

The next grade of finish is called *supercalendered*, and this is applied in a calendering stack to the made paper. The paper is first damped, as clothes have to be damped before they are ironed, and a high degree of polish can thus be imparted.

If you look at almost any sheet of paper you will be able to distinguish one side from the other; one surface will appear slightly rougher than the other. This under-side

carries the 'wire-mark' and no amount of calendering will eradicate it entirely. Some twenty-five years ago, therefore, a new and revolutionary machine was invented to make a *twin-wire* paper—*i.e.*, a machine which makes two sheets in the manner outlined and marries the two under-sides half-way through the manufacturing process. The resulting sheet has two surfaces of almost identical smoothness, the only drawback being that a really thin paper cannot be made in this way.

Fine photographic illustrations require a very high degree of smoothness, and, with certain qualifications, this is supplied by coated or *art paper*. In a later chapter the half-tone process will be gone into; it is sufficient here to say that, generally speaking, a fine half-tone block needs art paper. The *body paper* is an ordinary machine-made sheet, and to this a coating of China clay or casein is applied. The coating-mill is often separate from the paper-mill and does not make its own body paper. The coating is applied by a brush (Fig. 6), and the coated paper is afterwards hung in festoons to dry. In recent years a new machine has been evolved which makes the body paper and coats it as well. This *machine-coated* paper has become very popular and has in many instances replaced supercalendered paper, particularly for magazine work.

Other special types of paper are required for various printing processes—offset lithography, photogravure, and the like—but the special properties in these are obtained by variations in the *furnish*[1] of the paper and not by finishing processes.

We must not leave this subject without referring to the question of grain in paper. At the wet end of the paper-machine the very aqueous mixture *flows* along the wire. If we look upon the flowing liquid as a river and the esparto or wood fibres as sticks floating with the stream we shall be able to see that the majority of the fibres in paper will

[1] A mixture of rags, wood, and esparto.

lie in the direction of the flow on the machine. If we look at a piece of paper in which the wire-mark on the under-side is prominent, the direction of the diamond pattern will indicate the direction of the grain. If the direction of the grain is not obvious from the look-through there are other tests that can be applied: (1) Take a sheet of paper and tear and fold it in both directions; it will usually be found that the tear and fold is easier and cleaner with the grain. (2) Cut two strips ½-inch wide of equal length from adjacent edges of the sheet and hold them upright from the bottom. The strip with the grain running across it will sag more than the other. (3) Cut a small oblong piece of the paper and moisten it on one side. The paper will curl up to form a tube, and the grain direction will be along the length of the tube. The direction of the grain in paper is important in two ways in book production. First, it follows that paper which bends and folds better in one direction than in the other will, when bound into a book, 'open' better if the grain runs down the page than if it runs across; for the leaves (where the grain runs down) will tend to fall open naturally. Not all publishers pay attention to this point, and, as a result, we get those awkward, clumsy books which will not stay open when leaned against the milk-jug! The paper-buyer for bookwork has to figure out his problem in this way: for a crown octavo book (7½ in. × 5 in.) the paper to be used is 30 in. × 40 in. A sheet of this size would take 32 pages, each 7½ in. × 5 in. on each side. It will be seen, therefore, that the grain should run the 30-inch way, so that the eventual book shall open to the best advantage.

The other way in which book production is affected by the grain in paper is in relation to the printing of coloured plates. Because paper is absorbent it takes up moisture from the air, and this may cause it to expand or stretch; and it will expand across the grain more than with it. In colour printing it is important that this expansion should be

minimized so that it does not interfere with the registration of one colour upon another. The greatest expansion should therefore be across the narrower way of the sheet. In other words, the grain should run along the *long* way of the sheet.

13

Printing : Setting the Type

WHEN we last looked at printing (in Chapter 10) we had carried the history of the craft up to the nineteenth century. But type-composition was still done entirely by hand. The hand-compositor was a craftsman, indeed, and his skill and speed had to be seen to be believed. Imagine the task of the compositors who had to set, letter by letter, the whole of the Bible, with its estimated 773,700 words and three and a half million letters. Each letter had to be transferred from its *case* to the compositor's *stick*, and some of the feats of speed which must have been performed nightly in the preparation of daily newspapers are fabulous.

In order to give an impression the right way round type has to be set the wrong way round, and the hand-compositor has taught himself to look at type upside down rather than to read it from right to left the right way up. The *compositor* (comp, for short) stands in front of his case with his stick held in his left hand. This stick is a clamp which can be adjusted to any required width of line on the page. He sets one line and adjusts the spaces between the letters so that the line is *justified* to the full width required. He sets further lines until his stick is full, and then transfers all the lines from his stick to a special tray called a *galley*, an operation requiring much care. When his galley is full the type is ready for *proofing—i.e.*, the type is inked and a sheet of paper is laid on the inked type to give an impression clear enough to be read and corrected. Mistakes are corrected by picking out the wrong letters with tweezers and substituting correct

ones, a process laborious and tricky, and therefore, as authors and publishers know to their cost, expensive.

That was the only method of composition from the time of Gutenberg until the end of the nineteenth century. Several composing machines were invented, but their inventors encountered two insuperable difficulties—justification (the spacing out of the line to the full width of the measure, so that all full lines are equal in length) and the disposal of the type when it was no longer required. In 1886, however, the first commercial Linotype machine appeared. The magazine of this machine does not hold type, but *matrices* (or metal moulds), from which the type is cast in the machine.

> The unit of production is a bar of type metal, its length and thickness corresponding to the measure and body of the type matter required. It is type-high, and on its upper surface it carries type characters in relief. It is therefore exactly similar to a line of movable type characters, if the latter is considered to be one solid piece of metal. This bar was originally termed a linotype (from *line of type*), but is now known as a slug, the registered name being reserved for the machine.[1]

In a modern multiple-magazine Linotype there are about 7000 matrices. The matrix is a plate or block of hardened brass, having on one edge one or two type characters deeply engraved in its surface. When not in actual use the matrices are stored in the magazine. When a key-button is touched a matrix is released and carried by a fast-running travelling belt to the *assembler box*. When a line of matrices is assembled it passes through the machine and is cast in molten metal and trimmed by knives so that it shall be true to a fraction of one-thousandth of an inch. The *slugs* are turned out at the rate of seven per minute (Plate V). They too are gathered in a galley, whence their progress is as for lines of movable type. The Linotype is a wonderful piece of engineering, and

[1] From *An Introduction to the Linotype* (Linotype and Machinery).

is capable of astonishing feats of speed and ingenuity. Without it the modern newspaper could not function efficiently.

In the nineties of last century Tolbert Lanston, of Washington, perfected his Monotype machine. This differs from the Linotype in that each letter is a separate piece of metal, as in hand-composition, and there are actually two machines involved in the production of a line of type—the keyboard and the caster. In the Linotype the depression of the keys on the keyboard results in the emergence from the machine of a line of type ready for use. When the Monotype operator strikes the keys holes are made in a roll of paper, giving rather the effect of a roll for a piano-player. To continue the analogy, this roll is afterwards 'replayed' in the caster, the holes passing over slots and causing matrices to be selected from which single types are cast. These types are then assembled and emerge from the caster as a line which can be handled in the same way as hand-set type. Everything that has been said about the ingenuity of the Linotype is equally true of the Monotype. Both are triumphs of precision engineering. But the Linotype is more speedy in operation, and is not challenged by the Monotype for newspaper work. For bookwork, however, the Monotype has usually been preferred. But the Linotype has made great strides, and many finely printed books are now set by this method.

There are three other systems of mechanical typesetting which we can but mention here. They are the Intertype and Typograph which cast lines of type in slug form, and the Ludlow, which also casts a slug from matrices assembled by hand. They have their uses, and important ones, but the vast majority of bookwork is set on Monotype or Linotype machines.

For thirty years men have been working on the idea of photo-mechanical typesetting, and there are now prototype machines in existence. These machines produce, not separate types or lines of type in metal, but photographic negatives

of the type which can be used immediately in the production of lithographic plates. The machines are extremely ingenious, and there is little doubt that eventually they will supersede the present methods of type-composition. At present, however, they are not economically practicable for the commercial production of print. Authors' corrections, expensive enough in conventional typesetting, are extremely costly. An experimental book, *Private Angelo*, by Eric Linklater, has been produced for Penguin Books, but one cannot see the system coming into general use in the immediate future.

Experiments have also been made in the production of books by photolithography from pages typed on one of the new electrical typewriters. This is all right for certain classes of highly technical works where a comparatively small number of copies is required, but it is not satisfactory for books intended for general reading.

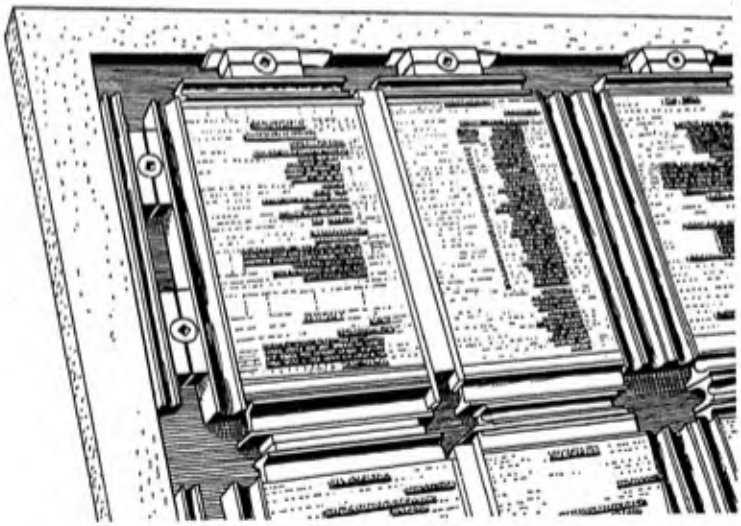


FIG. 7. TYPE IN CHASE

See p. 92.

14

Printing : Machining the Pages

IN the last chapter we were considering the methods of composing types. In this we shall look at the other processes in the letterpress printing-shop. (The word 'letterpress' is used to denote the method of printing from raised type, as distinct from such processes as lithography and photogravure.)

We saw in the last chapter how the composed type was laid in a tray, called a galley, before being proofed. The galley is some two feet long, and the type in a full galley will represent three or four pages of the finished book. *Galley proofs* (sometimes called *slip proofs*) are usually sent to the publisher, who passes them to the author to be corrected, because corrections are easier to make in a galley than when the type is made up into pages. For instance, a correction may involve several lines, and if the type is in pages such a correction may mean that words have to be overrun from one page to the next and so on, an expensive operation. When they have been corrected the galley proofs are returned to the printer, and the *stone-hand*, as he is called, carries out the corrections. This is a highly skilled operation requiring deft fingers, for it is very easy to 'pie' or disarrange the type while correcting it.

After being corrected the type is made up into page, and at this stage it is usually imposed ready for printing. The pages are laid down, or *imposed*, in a metal frame called a *chase*. The pages are imposed in a certain order so that when the printed sheet is folded they will fall into numerical order (Fig. 8). The type is wedged tightly with wooden or

metal blocks, commonly called printers' furniture, and the chase is locked up by the insertion of metal wedges, so that it can be carried without fear of the type falling out.

From these *imposed formes* page proofs are pulled off to be checked again by reader and publisher to see that the galley-proof corrections have been accurately carried out. This is an appropriate moment to look at the printer's *reader*, or, as he is more properly called, the corrector of the press. When the printer takes his first proof from the galley there are, of

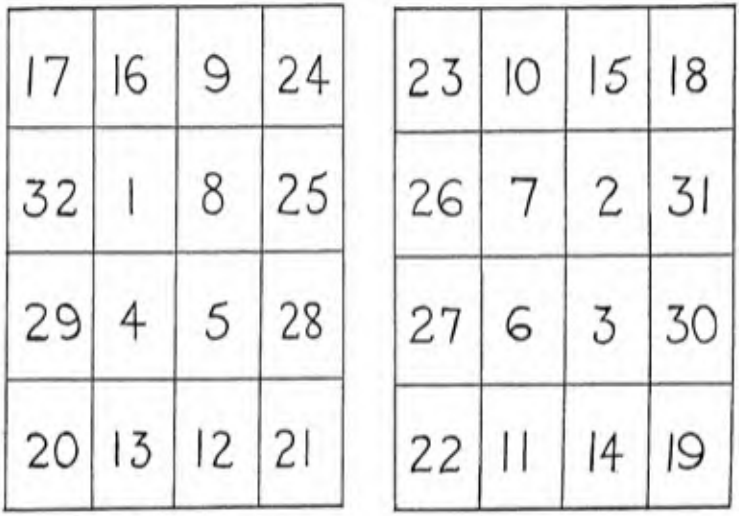


FIG. 8. TWO FORMES SHOWING HOW THE PAGES ARE IMPOSED FOR FOLDING

course, a number of *literals*, or misprints, the keyboard operator having to work at high speed. These first proofs are read over by two men working in a little sound-proof box of a room, and, after the type has been corrected, further proofs are pulled off for submission to the publisher. Before, however, they are sent away the proofs are read by an expert reader, and many are the stories that can be told of his

uncanny knack of spotting, not merely misprints, but errors of fact. A reader, when asked how he managed to raise queries on Greek text when he himself knew no Greek, replied that words "looked wrong," and so he queried them. And he was very often right, and earned the gratitude of the authors concerned. In a book containing the diaries and letters of the daughter of a famous Victorian statesman a reader queried some of the items in the diaries, and, on investigation, it was found that it was the diarist who was at fault! Another case was a book about Scotland by a Frenchwoman. The author had written it in French, and had translated long passages from Scott. When these passages were translated back into English for publication they differed considerably from Scott's original. Without any fuss the reader, with no instructions to guide him, substituted the correct passages, and Scotland's honour was saved again! Ask any experienced author and he will be able to cap these examples with others from his own experience. In the publishing of books the correctors of the press play an honoured part. No finer tribute has been paid to the reader than the following verses, entitled "The Reading Room":

Come through this door; shut out the busy strum
  Of press and caster. To this quiet Heart
  Of all the printer's Mystery and Art
The loud Machine will never, never come.

Here sit the Readers, as in days of old,
  Listening, looking, waiting to uproot
  The seedling Error, lest its bitter fruit
Scatter and multiply ten thousand-fold.

And Satan, wincing, cries in vain: "Ah, no!
'Tis but a minor query . . . LET IT GO!"[1]

[1] From *The Monotype Calendar*, by permission of the Monotype Corporation, Ltd.

To return to the proofs; we saw them being sent to the publisher for forwarding to the author. When they come back to the printer, corrected and marked "For Press," they are read once more, and the type is finally ready to go on to the printing-machine. It is to the machine-room, therefore, that we must now turn our attention.

The corrected formes, securely locked up and with the pages imposed in the right order (see page 117), are conveyed to the machine-room and laid on the press ready for the process of *make-ready* to begin. Meanwhile we will take a brief look at the development of the printing-machine from the days of the cumbersome hand-press to the modern fast-running cylinder machine.

The principle behind the printing-press is implicit in its name: a sheet of paper is *pressed* against inked type, so that an impression is conveyed to the paper. When the earliest printers wanted a press they adapted wine-, linen-, and cheese-presses to their purpose, but in the early sixteenth century a copper screw was introduced and a sliding bed and *tympan* and *frisket* were added. All these earliest presses were made of heavy wood, but in 1798 Lord Stanhope invented an iron press, and metal has steadily superseded wood from that time.

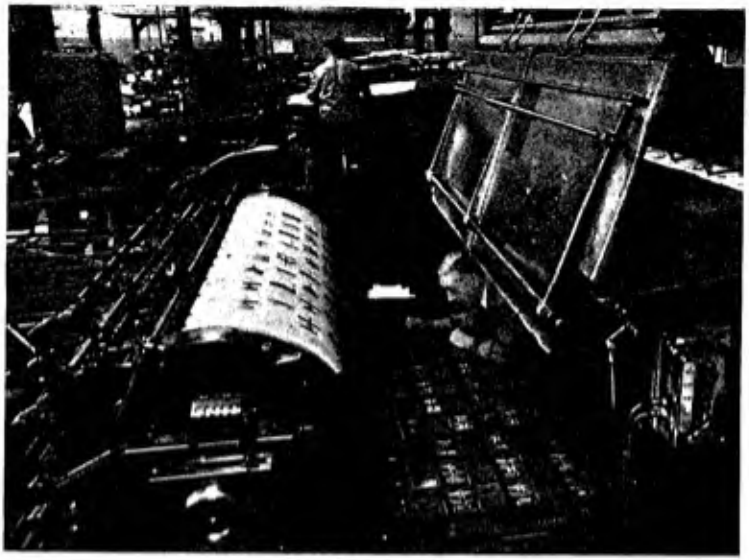
The hand-press consists of a frame which contains the bed, upon which the forme is laid, and a mechanism for running the bed under the *platen*, a flat surface which applies the pressure. Hinged to the bed is the tympan, which holds a canvas or vellum sheet on which the paper is fixed. The forme is inked by rolling with a hand-roller of a rubbery composition. In earlier days the inking was done by dabbing the forme with an inky ball made of leather and filled with sand. When the forme is inked the tympan is lowered and the forme run beneath it, and the platen is lowered under considerable pressure. The platen is then raised, the bed slides away, and the tympan is lifted. The printed paper is removed, usually to be hung over a line, like the washing,

to dry. These operations are repeated until all the sheets are printed on one side, and repeated again if the other side of the sheet is also to be printed. This process is slow and ponderous, and it will readily be appreciated that only small editions could be printed in this way in a reasonable time.

In the early nineteenth century an Englishman, William Nicholson, worked out the theory of the cylinder printing-machine, but failed to make any practical use of it. In 1814, however, two Germans, Koenig and Bauer, built the first steam printing-press for *The Times* newspaper. It was completely successful and revolutionized the printing industry. The modern printing-press embodies the same principle. Nicholson's idea, which was adopted by Koenig and Bauer, was to substitute cylindrical pressure for the platen pressure and to incorporate a reciprocating bed. As the bed passed under the cylinder, to which a sheet of paper was attached, the cylinder revolved and pressed the paper against the type, which had been inked by passing under inking rollers. This machine produced printed sheets at the rate of 1100 per hour, a vast advance on the output of a hand-operated press. The newspaper press developed apace, until to-day the giant rotary presses used for the mammoth-circulation newspapers produce 60,000 complete copies in an hour. Machines for bookwork have proceeded on less spectacular lines and without such emphasis on phenomenal speeds.

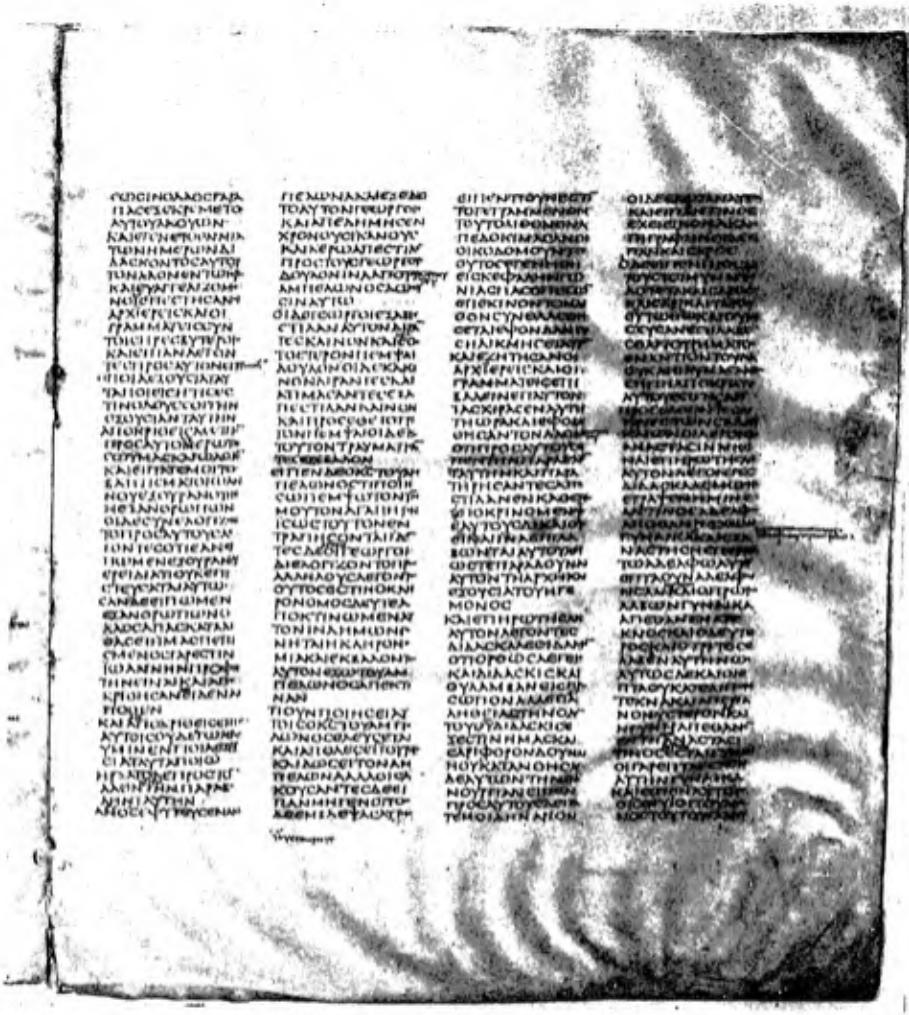
To-day the machines used for bookwork are for all practical purposes of two kinds, the stop-cylinder press and the two-revolution press, and we shall take a quick look at both. The stop-cylinder press is more commonly known as the Wharfedale, from the fact that the first machine of this kind was made, nearly a hundred years ago, at Otley, in Wharfedale, Yorkshire. Otley remains a centre of printing-machine manufacture, but the so-called Wharfedale machine is now made in many other parts of the world.

The principle of the Wharfedale is the same as that of



Making Ready
See pp. 98–99.

General View of a Bindery
See pp. 117–123.



A Page from the Codex Sinaiticus

See p. 22.

The Times machine of 1814. The inking is done automatically. The reciprocating bed, bearing the type, travels twice under the cylinder for each impression. On the forward stroke the bed passes under the cylinder without engaging it, and during this motion a sheet of paper is fed under the grippers on the cylinder. On the second stroke the bed engages the cylinder and an impression is made on the sheet. As the bed returns the grippers release the sheet, and it is carried by rollers on to an endless moving band which deposits it on to the delivery-board, and the bed begins the process over again. The sheets are fed into the machine, either by girls or boys working rhythmically in time with the machine or by an automatic feeder with an almost human delicacy of touch and precision. This machine produces from 1000 to 1500 printed sheets per hour, and may take a sheet as small as crown (15 in. × 20 in.) or as large as double quad demy (45 in. × 70 in.), but prints only one side at a time.

The two-revolution machine, more commonly and loosely known as the Miehle,[1] is in action fundamentally the same as the Wharfedale, but, whereas the cylinder on the latter stops when the bed returns to the non-printing position, the cylinder on the Miehle continues to revolve. The double result of this continued revolution of the cylinder is greater speed and the elimination of the vibration caused by the continual stopping and starting in the stop-cylinder machine. This absence of vibration is often demonstrated by standing a pencil on end on the feeding-board while the machine is running. The speed of these machines is considerably greater than the Wharfedale, varying from 2000 to 3000 impressions per hour.

It is the very nature of engineers always to be seeking to improve and develop their machines, and it was inevitable

[1] 'Miehle' is used here in a generic sense. There are now a number of makes of two-revolution machines on the market, one of the best-known made by the modern firm of Koenig and Bauer (see Plate VI).

that such developments should take place in printing-machines. There are now machines, called *perfectors*, which print both sides of the sheet in one operation, and others which print two colours in one operation. So far there are no further developments, but when, as we shall see later, there are already four-colour litho-offset machines, we can see that the possibilities are endless.

We must not leave the machine-room without reference

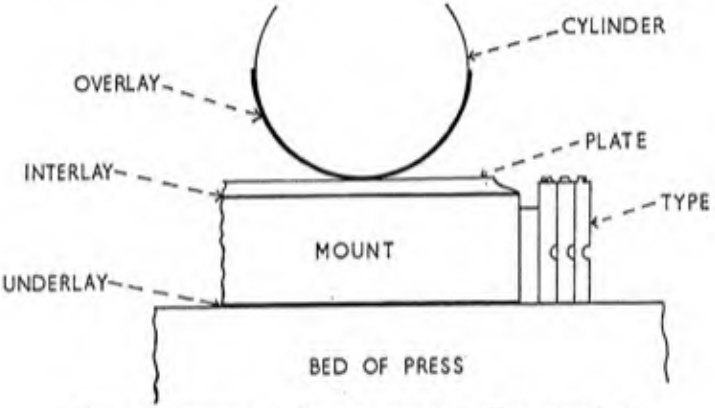


FIG. 9. OVERLAY, INTERLAY, AND UNDERLAY IN MAKE-READY

to the important matter of *make-ready*. This is one of the basic elements in good presswork. If you look at a proof which has been pulled from type which has not been made ready you will notice that it is blurry and uneven in colour and that some letters are 'high'—*i.e.*, they have jumped up above the others and have impressed the paper much more deeply. A forme which has been properly made ready will give an even impression, sharp (not blurred), and with an even depth of colour which does not vary from page to page. This business of make-ready is a comparatively long process and one requiring great care and patience. Large type offers more resistance than small type, and large areas of

small type will more easily fill up with ink than single lines. Similarly, solid portions of line and half-tone blocks need more pressure than delicate or 'high-light' parts. This variation in pressure on the machine was, until recently, invariably obtained by packing with sheets of paper and by the insertion of *overlays*, *underlays*, and *interlays*.

"PRIMATON" OVERLAYS

Fig. 9 shows how these various kinds of make-ready were inserted. Nowadays, however, what is called mechanical make-ready is used.

The principle of the "Primaton" overlay is fusion of powder and ink.

A well-inked machine pull is taken and immediately dusted with a fine "Primaton" powder. The powder adheres to the printed pull in varying degrees according to the extent of solids, tones, and highlights of the subject concerned. At this stage the operator removes by means of a camel-hair brush any surplus powder, at the same time dressing the overlay to enhance the plate etchings. To effect fusion the overlay is placed in an electrically heated oven for approximately 1½–2 minutes, after which time the ink and powder have blended to complete the overlay ready for application.

The pressman will spend many hours on making ready a 64-page forme; he is a craftsman whose satisfaction lies in the beautifully clean printed sheet which emerges from the machine.

No more fitting end to this chapter can be found than these lines, entitled "The Machine-Room":

> If Caxton came to Earth again,
> I doubt if he would guess
> That all this mass of Groaning Steel
> Could be a printing Press.

But if he saw a sheet held high
  Against the light, to show
Line over line in Register . . .
  Then surely he would know!

With just that timeless Gesture, he
Flung high the word, for heaven to see.[1]

[1] From *The Monotype Calendar*, by permission of the Monotype Corporation, Ltd.

15

Typography and Illustration

IN our study of the rise and growth of printing we have here and there touched on the varieties of typefaces, the cutting of types, and the design of books. Let us now look a little closer at these subjects.

We have seen how writing developed from pictures and how the first typefounders tended naturally to copy the handwritten characters of the scribe. The first breakaway from this Gothic style (as it is called) was made by Conrad Sweynheym and Arnold Pannartz, who set up a printing-press at Subiaco, in Italy, in 1465, and whom we met in Chapter 5. This type retained the fundamental characteristics of Gothic, but plainly showed the influence of the new Roman style of handwriting which was favoured by the scholars of the Renaissance. The transition from the Subiaco type to the pure Roman types was easy. The Da Spira Brothers of Venice (1469) and Nicolas Jenson of the same city (1470) completed the transition, and produced the first purely Roman types. Jenson's type survives to-day in the beautiful interpretation by Bruce Rogers known as Centaur. The next name to be mentioned in the history of type-design is that of Aldus Manutius (see page 47). His Roman type, which he used for a small tract by Pietro Bembo in 1495, became the model on which all subsequent *old-face* types were based, and survives in the present-day Monotype Bembo face.

In 1501 Aldus began producing his cheap reprints, and for these he used what were the first *italic* types, designed by Arrighi and Blado. Their types survive to-day in the beautiful recut versions put out by Monotype.

Later type-designers whom we have room only to mention were Robert Estienne (Linotype Estienne), Claud Garamond (Linotype Granjon), Christopher Plantin (Monotype Plantin), William Caslon (Monotype and Linotype Caslon), Pierre Fournier (Monotype Fournier), and John Baskerville (Monotype and Linotype Baskerville). The type now known as Garamond (Monotype) is actually based on the designs of Jean Jannon (1620). When they were revived in the nineteenth century they were wrongly attributed to Claude Garamond. Garamond's type is now known as Granjon because he was an independent typefounder who sold his types to various printers, including Robert Granjon.

All the types we have so far mentioned come within the category known as *old face*. Giambattista Bodoni (1740–1813) broke away from this style and produced a face which set the pattern for what are known as *modern* faces. The distinctions between *old face* and *modern* are three: (1) in old face the stress is oblique; in modern, vertical; (2) old-face serifs are oblique; in modern, horizontal; (3) in modern faces the difference between the thick and thin strokes of the letters is more pronounced than in old face. Bodoni was followed in 1787 by Richard Austin, who cut the first English modern face for Richard Bell, after whom the type is now named (Monotype). These faces were followed by Miller and Richard's face, now known as Scotch Roman, and by Justus Walbaum's beautiful type, which was revived by Monotype in 1933.

In 1850 Miller and Richard produced an *old-style* type which was based on Caslon's types and started a reaction against the modern faces of Bodoni and Austin. Old Style has been developed in recent years and flowers with great distinction in Imprint, designed by Gerard Meynell for the Westminster Press's house journal of that name; in Times Roman, specially cut in 1932 for *The Times* newspaper; and in Eric Gill's very elegant Perpetua.

This brief survey of type-design leads on quite naturally

to a short study of typography, which is the art of using type in the best possible way to give maximum legibility combined with taste and beauty—and a lot more besides! Seán Jennett describes the work of the typographer thus:

> He does not set type, nor does he operate the press; very likely he is incapable of doing either of these things. But he studies his materials and technical requirements, and selects with care and purpose the elements that are to go towards an ordered whole. His knowledge and experience should not be limited to letterpress printing, but should extend over the whole field of book production to include other printing processes, process engraving and binding, and the subleties of type design and of paper quality and kind. He chooses and directs artists to illustrate or decorate particular books, or to design jackets for them, keeping, in the case of the jacket, an eye on the psychology of sales appeal. In short, the typographer's work is, in part—and in good part—a collation, with all the elements of that collation flowing in an ordered stream in space and time towards the completion of the book.[1]

We have looked at some of the outstanding landmarks in the history of type-design; we have looked at printing processes, at papermaking, and bookbinding. In the remainder of this chapter we shall look at some of the things which go to make the inside of a book a thing of beauty and a joy to read.

One of the first things which the designer of a book has to do is to select his typeface. In Appendix I are shown some of the best of the faces which are available on the Monotype and Linotype to-day. If we look at those types, all printed on one kind of paper, we shall notice that some 'look' better than others, which means that the typeface selected for a particular book must be chosen for its suitability for the paper on which it is to be printed. If we look at a number of books we shall probably notice, too, that some types look better in large sizes and others is small sizes. We shall notice

[1] *The Making of Books*, Seán Jennett (Faber).

that some faces are cold and dignified, while others are frivolous and seem to dance across the page. All these, and other, factors have to be borne in mind when the type for a book is selected.

The next and probably the more important thing to consider is the arrangement of the type on the page. The type area must not seem too large for the size of the page, and it should not be centred on the page—*i.e.*, the margins should not be equal. A correct arrangement would show a reasonable type area with the margins of the page in the ratio 1, 2, 3, 4, starting from the inside, or gutter, margin and proceeding to head, fore-edge, and tail margins. Individual typographers will vary that ratio in special circumstances, but in the vast majority of cases it will be found to be the right one.

Another respect in which type arrangement is important is in the matters of type-size, leading—*i.e.*, spacing between lines—and word-spacing.

If this book were set in 14 point type thus:

The tramp of horses was now heard, and the

you would know at once that the type was too large. 6 point, thus:

party of footmen, who joyfully shook their pikes and clashed their brown-bills for joy of her

would strike you at once as being too small. In fact, this book is set in 11 point, but so also is the following:

appeared, surrounded by several Riders, and a much stronger party of footmen, who joyfully shook their pikes and clashed their brown-bills for joy of her freedom. She herself, richly

yet it is not so easily readable as the ordinary setting in the book, because the leading between the lines is too great. The eye has to jump too great a space downward at the end

of each line. Again this line is difficult to read because the spacing between words is insufficient:

She herself, richly attired, and mounted on a dark chestnut pal-

Similarly the words in these lines are too widely spaced, making for jerky reading:

recovered all the dignity of her manner, and only an unwanted degree of paleness showed the suffering she

These are just some of the problems which face the book-designer. The principles which guide him are the same to-day as in Caxton's time.

The book-designer must also be concerned with the illustrations in a book, for type and pictures must be blended into a harmonious whole.

The earliest form of illustration was the woodcut. In an earlier chapter we saw how, in the block-book, the whole page was carved from a block of wood. This method of reproducing illustrations is, of course, still in use, the potato cut, the lino cut, and the wood engraving being modern variants in common use. In the vast majority of letterpress printing, however, process engraving is the method used for reproducing pictures in books. This has been made possible through the development of photography and electrolysis.

For a long time after the invention of printing from movable type, the woodcut was the only method of reproducing illustrations, and some of the work produced in the sixteenth century was superlatively good. By the middle of the century, however, a new art, that of engraving on copper, had come to challenge that of the wood-engraver. Engraving on copper gave the artist more freedom and more scope; he could more easily obtain half-tone effects and gradations of shadow. By the end of the sixteenth century copperplate-engraving had very nearly superseded the woodcut, and the art of wood-cutting virtually disappeared until the eighteenth century, when it had a revival. The difficulty

with copper-engraving, however, was that the illustrations could not be printed at the same time as the text; for copper-engraving is an intaglio process, letterpress a relief one. Very often, indeed, the engravings were printed separately and pasted into blank spaces left in the text. In the nineteenth century the development of the art produced the coloured engravings known as *aquatints*, and the work of men like Thomas Rowlandson and James Gillray, at the end of the eighteenth century, and Henry Alken, George Cruikshank, Hablot K. Browne, and John Leech was excellent.[1]

At this time the art of wood-engraving received a new impetus from the use of wood-engravings in weekly periodicals. In 1842 the *Illustrated London News* was founded, and for many years its double-page wood-engravings remained a feature. These wood-engravings were often made by four men, each working on one quarter of the picture, the four pieces being jointed together to form a remarkably homogeneous whole. Other beautiful examples of wood-engraving were the landscapes of Birket Foster, engraved by the brothers Dalziel, the illustrations of *Alice in Wonderland* by Sir John Tenniel, and the work of men like Rossetti and Sir John Millais.

In the seventies came the invention of the line block, or *zinco*, and in 1880 the half-tone plate, which, for all practical purposes, put an end to the use of wood-engraving and copperplate-engraving for commercial purposes. It is to these new processes that we now turn our attention.

The line block is used for reproducing any illustration done in Indian ink. It cannot be used for reproducing wash drawing (or, indeed, pencil) in which there are any half-tones. The drawing is photographed (it may be enlarged or reduced, of course) and the negative is printed down on to sensitized zinc. The image is then coated with grease and

[1] Leech, Alken, and Browne (known by his *nom de crayon* of "Phiz") illustrated the novels of Surtees, and Browne and Cruikshank those of Dickens.

the whole plate immersed in an acid bath. The acid eats away the uncoated portions, and the image is left standing in relief. The metal is mounted on wood to make it type-high, and is ready for printing.

The problem of reproducing a pencil drawing, a wash drawing, or a photograph is more complex, for there are half-tones to be considered. What are called mechanical tints can be added to a line block to indicate variations in texture (Fig. 10), but they do not give the proper half-tone effect. In relief printing all the ink deposited on the paper must come from surfaces of the same height.

> The illusion of intermediate tones is therefore produced by breaking up the image (by the use of a cross-line screen) into equally spaced dots of varying size to give the effect of continuity of tones; each dot prints a solid black. The cross-line screen is adjusted immediately in front of the negative in the camera. It consists of two pieces of plate glass, each of which is engraved with parallel lines filled with opaque pigment, and cemented together so that the lines are at right angles. The lines and the clear space between them are equal in width. The lines may vary from 45 to 225 to the linear inch according to the smoothness of the surface of the paper to be used; rougher papers require more open rulings, as the interstices between the dots would fill up and result in a muddy print.[1]

The photograph or drawing, then, is photographed with the cross-line screen in front of the plate. The exposure is made with a prism in front of the lens so as to reverse the image. (This reversal, of course, is necessary so that the eventual print is the right way round.) The negative is printed down on to a zinc plate (for cheap work) or a copper plate, and the image is coated with bichromated fish-glue. The plate is then heated, the process turning the fish-glue into an acid resistant. Next the plate is put into an etching machine, which contains nitric acid (for zinc) or perchloride

[1] *Printing To-day*, John C. Tarr (Oxford University Press).

of iron (for copper), to eat away the uncoated metal. The etching may also be done electrolytically, by immersing the coated plate in a bath containing ammonium chloride and sodium chloride and passing an electric current through the solution. The exposed metal is dissolved and the image

FIG. 10. THE DRAWING ON THE LEFT IS A LINE BLOCK, THAT ON THE RIGHT IS A LINE BLOCK WITH MECHANICAL TINTS

left extant. After this mechanical etching the plate has to be re-etched by hand to bring up highlights.

When additional colours are required it is true to say that each additional colour will require an additional block and an additional printing. For colour line work the production of the additional blocks is merely a repetition of the first blockmaking. A line drawing which is to be printed in, say, three colours may be submitted to the blockmaker in all its

coloured glory, and, of course, he can make his three blocks from it. The colours will have to be separated photographically and each block made from the negative which represents each colour. Great care has to be taken to ensure that the three exposures are taken from exactly the same distance, so that when the blocks are made from the negatives they will *register* exactly—*i.e.*, the colours will not overlap each other, but will fit exactly together. Time and expense can be saved if the artist can be persuaded to make a key drawing and indicate the other colours by transparent overlays of tracing linen or plastic.

This process, of course, can be used only for designs painted in absolutely flat colours. Any design which contains gradations of colour or colours which are not self-colours must be reproduced by colour half-tone, and here the skill of the blockmaker reaches its zenith. But before we pay tribute to his craftsmanship it is necessary to see how his craft has been made possible by the work of the physicist.

Before the invention of the half-tone process, colour printing was confined to line work, with the addition of various kinds of tints and stipples. Indeed, many books were issued with hand-coloured plates—*i.e.*, they were printed in black outline and the colours were applied by hand. It was not until the discovery that all the colours of the spectrum can be produced by combining and recombining the three primary colours, red, yellow, and blue, that colour photography and, consequently, colour reproduction could march forward. To-day, the child with his paintbox knows that if he mixes red and blue together he will get violet; he does not perhaps realize that he is demonstrating a fundamental optical principle. This principle is shown in Fig. 11.

When applied to photography this principle makes it possible by the use of filters to separate the colours in a painting. An orange filter, for example, placed between the camera and the object absorbs all colours except red, orange, and yellow, so that the photograph so taken will represent only

those parts of the picture which have yellow in them. When the picture is photographed through orange, green, and violet filters in turn three negatives can be produced from which a set of tricolour blocks can be made. If these three blocks are printed exactly one on top of the other a commercially accurate reproduction of the original picture can be ob-

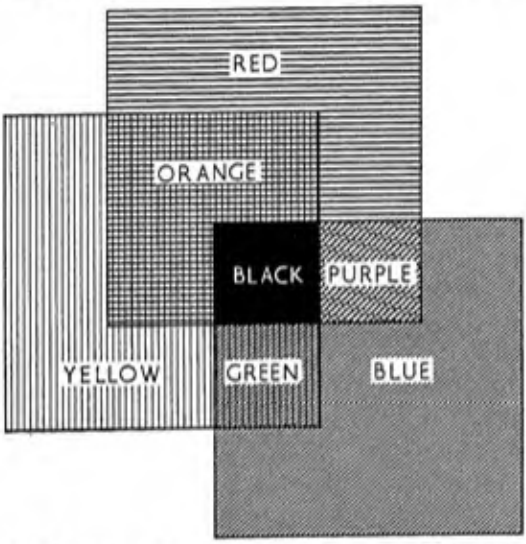


FIG. 11. DIAGRAM TO DEMONSTRATE THE TRICHROMATIC PRINCIPLE

tained. For greater faithfulness of reproduction one, two, and even three printings may be added in the same way.

If the foregoing suggests to the reader that blockmaking is a simple automatic process an entirely wrong impression has been given. No doubt a set of half-tone colour blocks could be produced by an untrained man equipped with the apparatus and a textbook; but I do not think you would like the printed result. The retoucher, who works on the negatives, and the etcher, who works on the metal plates, are craftsmen of the very greatest skill. But the technicalities

of their work cannot be dealt with in a small book like this. We must pass on to the other printing processes which have not yet engaged our attention.

Up till now we have been looking at *letterpress* printing—*i.e.*, printing from raised surfaces, whether type or blocks. We must turn now to the *planographic* processes—*i.e.*, taking prints from a flat surface. These processes are two in number—lithography and collotype—although there are several variations within the two main processes.

Lithography (from the Greek *lithos*, "a stone," and *graphein*, "to write"), as its name suggests, was originally a process of printing from stone. It was invented at the end of the eighteenth century by Aloysius Senefelder, of Munich. He is said to have come upon the art by accident, much as Newton and Watt made their great discoveries. Two stories are often quoted to explain his discovery. One, given by Senefelder himself, is that he was etching on limestone when his mother asked him to make out her laundry list. He wrote the list in wax crayon on a piece of limestone, and in subsequent idle experiment found that he could make a print from the inscribed stone. The other story describes how, after sitting on a smooth rock one rainy day, he discovered that the impression made by his greasy corduroy trousers confined the rainwater to the tiny channels thus made. However the discovery was made, lithography depends upon the principle of the attraction which limestone has for water and greasy substances and the fact that water and grease will not mix. If a slab of limestone is written or drawn upon in a greasy medium and a damp roller is passed over it, the surface of the stone will absorb the moisture, but the greasy lines will repel it. If a roller charged with greasy ink is next passed over the stone the damp surface will repel the ink, but the lines of the design will take it up, and an impression of the design may be obtained by pressing a sheet of paper over the stone. The art of lithography began, therefore, as a process whereby the artist could draw a design on

stone and thence make a number of very faithful copies. The results are soft, as opposed to the hard, sharp outline of the letterpress print. Beautiful effects can be obtained which are impossible for letterpress printing.

In the eighteen-thirties the process of chromo-lithography was developed by Weishaupt and others, the extra colours being provided by the use of extra stones superimposed over the key printing. To-day the art of auto-lithography—*i.e.*, of drawing on the stone and printing directly from the drawn image—is still in use, as the work of many modern artists shows. The reader is referred to the excellent results shown in many of the "Puffin Books"[1] as fine examples of modern direct lithography.

While stone was the original material used in lithography. it has largely been replaced to-day by zinc, aluminium, or, plates. These have the advantage of being lighter in weight and less bulky, as well as being cheaper. Metal plates have to be grained mechanically before use, the graining being done by agitation in a bath of water and sand, over which hundreds of glass marbles perform a fantastic war-dance.

The artist, because his print is direct from the stone or plate, has to draw in reverse so that the impression shall be the right way round. In a moment we shall look at a more modern invention, offset lithography, which enables the drawing to be made the right way round, because plate and paper make no direct contact. It must be noted also that there is no trichromatic principle in lithography. Each colour requires a separate stone or plate, a drawback which, we shall see, has been overcome by the introduction once more of photography in photo-lithography.

The machine used for printing in direct lithography is similar in many ways to the letterpress machine with the addition of damping-rollers. These rollers keep the stone or plate wet so that the ink from the inking-rollers adheres only to the greasy image which is to be reproduced.

[1] Published by Penguin Books, Ltd.

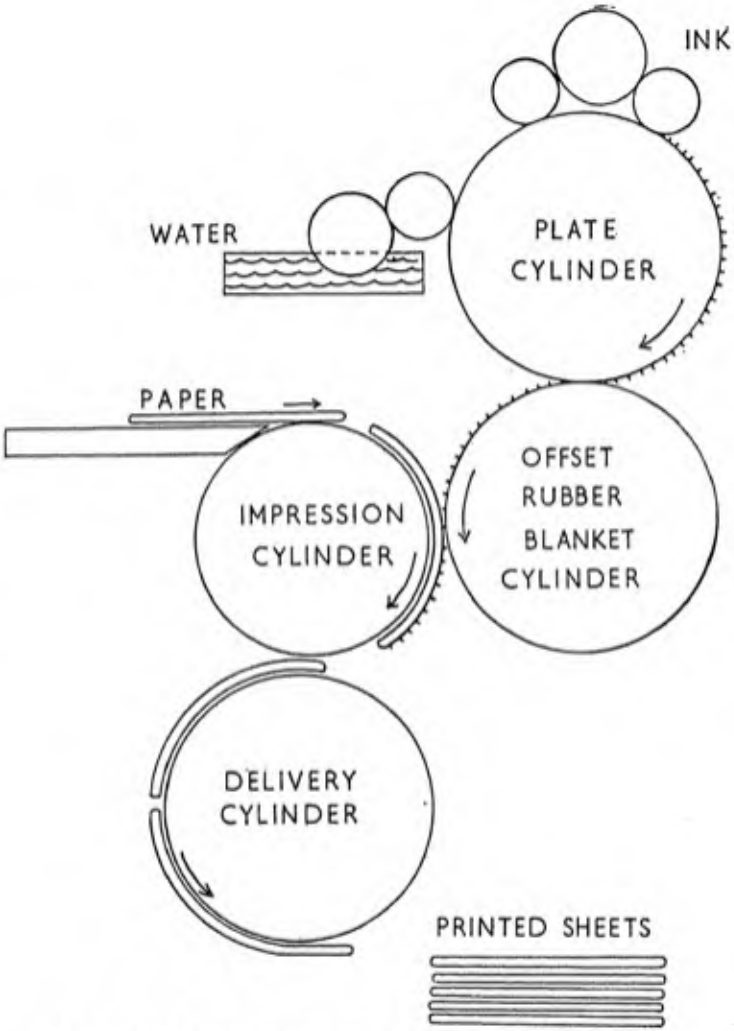


FIG. 12. DIAGRAM SHOWING THE PRINCIPLE OF THE OFFSET LITHOGRAPHIC MACHINE

When we turn to offset photo-lithography we come to two developments unheard of until comparatively recent times. The application of photography to lithography brought about a change similar to that made when photo-engraving began. Anything that can be photographed can now be reproduced by lithography. The stone, or, more usually, the plate, is sensitized and the photographed image is printed down to it. Subjects in pure line are photographed directly as in line-engraving, but subjects containing gradations of tone are photographed through a screen. The trichromatic principle is employed for colour reproduction, and most coloured photo-lithography is done by means of three or four plates only.

The advent of the offset process has revolutionized the industry. Employed first as a means of printing designs on tins, it was only later adapted for use on paper. This process introduces an intermediate operation in the printing. The cylinder carrying the metal plate is damped and inked and transfers an impression on to a rubber offset roller (or blanket, as it is called), which in turn makes an impression on the paper. The artist, therefore, who works for photo-lithography does not need to draw in reverse, because of this intermediate operation. The principle of the offset machine is illustrated in Fig. 12.

Offset photo-lithography is now widely used in book-printing, not only for illustration. In an earlier chapter we noticed how books were reprinted, by means of stereotypes, after the type had been distributed. In recent years the cost of stereo metal has rocketed to such an extent that photo-offset has in many respects superseded it. Instead of making moulds from the type (itself a costly process to-day), in case it is eventually necessary to reprint (when, of course, the cost of making stereo-plates must be faced), the publisher can distribute his type with something approaching complacency. The only step he has to take is to preserve two good

copies of the book for future use. Then, when a reprint is required, these copies can be photographed and the reprint made by offset lithography. At one time reprints made in this way were most unsatisfactory, but improved methods are now in use, and the results are so good as to be almost indistinguishable from letterpress printing.[1] If the process continues to improve and to become cheaper it is likely to oust printing from stereoplates altogether. For stereoplates wear out, and have to be renewed before the impression from them becomes illegible. With photo-offset, printing quality can be maintained indefinitely, provided the negatives are preserved.

The other planographic process is collotype. This process is used for reproducing fine illustrations, in monotone or colour, where absolute faithfulness of reproduction is required. It differs from lithography in that the printing surface is a sheet of glass, which is coated with an emulsion of bichromated gelatine. The trichromatic principle does not apply to collotype, so that a delicate work of art, for instance, will require seven or eight printings to give a faithful reproduction. This makes the process expensive, and its use for book illustration is therefore limited.[2]

Photogravure, the next process we shall look at, is an *intaglio* process—*i.e.*, prints are taken from the recesses on the plate, from which layers of ink of different thicknesses are delivered to the paper to give gradations of tone in the original photograph. Photogravure is not a new invention. Many books produced at the end of the nineteenth century are embellished with photogravure plates, but these were produced on a hand-press. Many of them were of great

[1] Offset printing, which makes no impression on the paper, can often be distinguished from letterpress, which impresses the paper, by feeling the printed part between thumb and forefinger. If the printing is letterpress you can often feel the *impression*; if the printing is offset you can sometimes feel the type *in relief*.

[2] The famous Medici prints, published by the Medici Society, are fine examples of coloured collotype.

beauty, but, being printed by hand, they tended to be expensive. To-day photogravure has become a business of big machines capable of producing enormous numbers of prints at high speeds. Hand photogravure is printed from a flat copper plate; the modern machine photogravure is printed from a copper cylinder, although some high quality machine-gravure work is done on a flat-bed machine. The image is printed photographically on to the plate or cylinder and then chemically etched. The varying tones of the picture are obtained by degrees of depth of etching, or, in other words, on the varying thickness of the ink-layer. On the printing-machine the plate or cylinder is flooded with ink and is scraped by a flexible blade, called the *doctor*, which

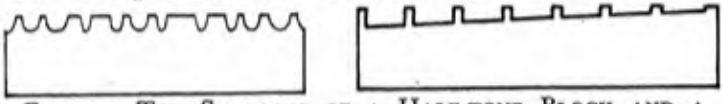


FIG. 13. THE SURFACES OF A HALF-TONE BLOCK AND A PHOTOGRAVURE PLATE AS SEEN UNDER A MAGNIFYING-GLASS

leaves the ink in the recesses but cleans it off the surface. The printing-plate then makes contact with the paper, and the operations of flooding, scraping, and impressing begin over again. Fig. 13 shows the difference between the surfaces of a half-tone block and a photogravure plate under a magnifying-glass. The rotogravure machine—*i.e.*, the high-speed machine with a cylinder action—is fed by a reel of paper, each revolution of the cylinder making one complete impression of the matter to be printed.

The depth of tone obtainable in photogravure is considerable, and very beautiful results are achieved. All the craftsmanship goes into the preparation of the plate or cylinder, a fact which renders the process very expensive for small numbers. It is therefore eminently suitable for publications, like *To-day*, which have very large circulations, but unsuitable, on account of expense, for books with small printing numbers, whose pages would undoubtedly be enhanced by its use.

16

The Binding and Bookjacket

IN medieval times the craft of the bookbinder, like that of the scribe and the illuminator, was confined to the monasteries, and some very beautiful work was done. Examples of it can be seen in the great museums and libraries all over the world. The exquisite tooling in gold and colours remains to this day a monument to the skill and the patience of those craftsmen. In the space of this book we cannot trace the course of bookbinding in any detail, but we can, at least, notice the various processes of hand-bookbinding, which have not changed since binding first began.

The sheets of a book, whether they contain 4, 8, 16, or 32 pages, have to be folded; that is why (as we saw in an

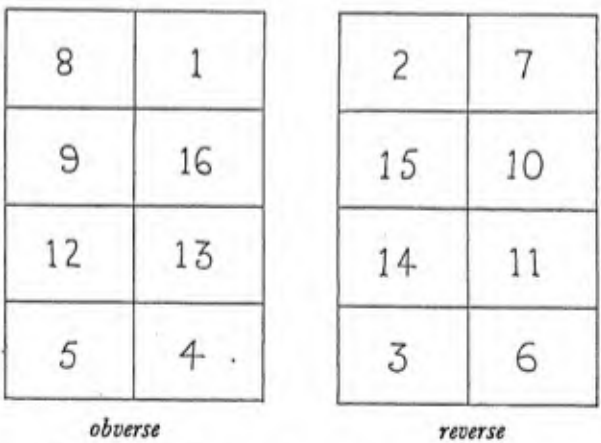


FIG. 14. A SIMPLE SCHEME OF IMPOSITION

earlier chapter) the pages have to be *imposed* on the sheet in a certain order. The simplest imposition is shown on page 117.

There are to-day many variations of this plan to suit various kinds of folding machines, but the example given is fairly standard for hand-folding. The next process is *gathering* (or collating)—that is, if the book is to contain more than one sheet, taking one copy of each sheet and putting them together in sequence. Nowadays it is the practice to add to the printed sheet a signature number or letter and a collating mark. The signature symbol will appear usually at the bottom left-hand corner of the first page of the signature, or section, often with the initials of the book's title added. Thus on page 17 of *Brer Rabbit* the reader will see "B (or 2)—BR" (assuming the book to be bound in 16-page signatures). The collating mark is a black mark which is so set that, when the sheet is folded, it falls on the outside of the fold. The collating mark appears at a different place on each sheet, so that the collator can see at once if he has mis-collated a book.

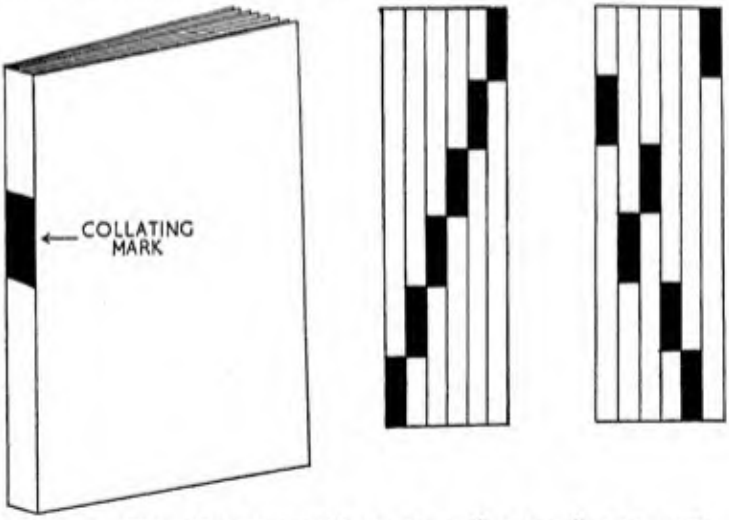


FIG. 15. THE COLLATING MARK ON A FOLDED SHEET, AND EXAMPLES OF CORRECT AND INCORRECT COLLATING

But, let it be emphasized, these are refinements which were unknown to the early hand-binder.

After gathering comes sewing, a process usually done now, of course, by machine, but formerly always by hand. For hand-binding sheets are not only sewn together; they are also sewn on to cords, which, when glued, help to hold the book in its case. Much edition binding to-day is sewn on to tapes, but much of it relies on some form of muslin or calico which is glued to the back of the sheets and to the case.

The case is tooled in gold or coloured foil, with the title and author's name and any desired ornamentation. Hand-bindings generally have far more ornamentation than the ordinary edition binding, and there is nothing more satisfying than some of the exquisite tooling which can be seen on the fine bindings in museums, libraries, and antiquarian booksellers' shops.

Before being put into its case the book is glued, rounded and backed, cut to size, and generally shaped to its ultimate end. All these processes as done by the hand-binder are laborious and slow, albeit the finished product may well be a work of art and will certainly be an honest piece of craftsmanship. Edition binding to-day, however, is almost entirely machine work, and the speed of output of a modern bindery is quite astonishing. Let us very quickly take a walk through such a bindery and see how the various processes are done to-day.

A well-designed bindery will be so arranged that the processes follow on one after the other, preferably on one floor, so that the sheets travel round or through the factory, steadily becoming more and more of a book. So, then, we shall probably find a railway train or a motor-van at the unloading bay delivering printed flat sheets from the printers.[1] Such sheets have to be handled with great care, for once you have broken the corner or the edge of a pile of sheets no amount of pressing or ironing will take out the

[1] Unless, of course, we are visiting a printer-binder, in which case the sheets will be brought over from one building to the other on some form of trolley.

creases. But we will assume that the warehousemen know their job, and pass inside the bindery.

The first machines we shall come to will be the folders. These ingenious machines, once set, fold sheets varying from 40 in. × 60 in. down to 15 in. × 20 in. at great speeds, reaching an output up to 50,000 signatures in a day. The principle of the folding-machine is simple and effective. As the sheet travels over rollers, arms come down and crease it at prearranged points and carry the folded sheet through a slit on to another plane, where the process is repeated until it is folded into a 16-page or 32-page signature.

As the folded sheets come off the folding-machine they are baled and tied with string in a hydraulic baler, and are passed forward to be collated, or gathered. The process of collating was, until fairly recently, entirely done by hand. There are now, however, collating-machines which do the work more rapidly, although the principle is the same. The hand-collator stands before a series of piles of folded sheets and moves along the line, taking one sheet from each pile, until at the end she has a complete book in her hands. The collating-machine is a long machine, consisting of a series of boxes (corresponding to the piles of sheets). When the machine is started up mechanical 'hands' take one signature from each of the boxes simultaneously and place them automatically in the correct sequence on a travelling band that delivers one complete book ready for sewing at the end of the machine every second.

The next stage is the sewing. This again is done by a machine which may be hand-fed or semi-automatic. These machines do not sew each book separately, but sew many books on a continuous thread. A girl sits at the delivery end of the machine and separates the books with a sharp knife. A semi-automatic sewing-machine can sew 5000 signatures per hour. After sewing comes 'smashing,' a process which is not quite so violent as it sounds. The smashing-machine applies very heavy pressure to the sewn books, which expels

air from between the pages and ensures a firm book of correct thickness. The book now before us is sewn and firm, but unopenable, except at the beginnings and middles of sections. The next process, then, is cutting. The modern three-knife trimmer, as its name suggests, will cut all three edges of a book (top, tail, and fore-edge) simultaneously. Such a trimmer will cut all three sides at the rate of about a hundred copies per minute—and there is a safety bar attachment which prevents the operator's fingers joining the pile of offcuts beside the machine!

While the contents of the book are being forwarded, as the series of processes we have just considered is called, the case-maker has been at work. The case in which a book is bound consists of two pieces of strawboard covered with leather, cloth, paper, or other material, the strawboards being glued to the material at such a distance apart that the intervening material forms the back (or spine) of the book. Case-making to-day is almost entirely a machine process. The binding material, the strawboards (previously cut to size), and strips of Kraft paper are fed into the machine, which has been set with minute precision, and the components are assembled, glued into position and pressed firmly before being ready for blocking, a final process in which the lettering and design, if any, are impressed.

A word about materials. Leather, in all its various qualities and grainings, is, because of its cost, reserved for more expensive editions. Most of us have some Bible, hymn-book, or similar publication which is bound in leather, either morocco or some cheaper kind. Very few of the books we buy for ordinary use are bound in anything so luxurious. For the ordinary everyday book, book-cloth has been the staple covering for half a century. It may vary in quality from the very cheap, which is little more than *mull* (a coarse kind of butter muslin) whose interstices are filled with a starchlike composition, much as imitation art paper is 'loaded' with China clay, to expensive canvases, linens, and

buckrams. In the footwear industry there used to be a slogan "There's nothing like leather"; in the bookbinding trade it is "There's nothing like cloth." By and large, this is true. Book-cloths are made to take gold, foil, ink, or blind blocking, and nothing is more pleasing to handle than a book well bound in cloth. Demands of cost, however, have sent publishers in search of substitutes for cloth. Before the Second World War various substitutes were on the market, mostly toughened and grained papers.

These were useful, but they lacked the strength and durability of even the cheapest cloth. Just before the War, however, there appeared on the market a material called "Linson," a three-ply material made of very strong manilla paper. The circulating libraries and the schools began by banning it for library or school use—because it was paper—but the manufacturers persisted. By dint of hard work and scientific proofs they eventually convinced the authorities that "Linson" is as strong and durable as any but the most expensive book-cloths, and, indeed, stronger than many of the cheaper ones. The result is that to-day the majority of school books and the lower-priced general books are bound in "Linson," or one of the other proprietary materials, and the improvements made in texture, colour, and graining make it difficult for any but the expert to detect the difference between it and cloth.[1]

But we digress. We had reached the point where the book was sewn and cut and the case was made and blocked. All that remains is to put the book into its case. This too is a machine job, the casing-in machine applying the paste, putting the book between its covers, and smoothing down its endpapers. Three more small operations and the book is ready to go out. First, pressing; the books are stacked in hydraulic presses and left for some hours until the glue is

[1] The writer takes some pride in the fact that he was one of the first two production managers to use "Linson" experimentally for school textbooks. In 1936 was it?

set and the books are firm and solid. Second, examining; each book is taken from its stack and opened by a foreman or forewoman, to make sure that its back will not break and that it is securely anchored in its case.

Before the book is finally ready to go out into the world to seek its fortune it is almost certain to be decked out in a bookjacket, gay or sombre, according to taste. Certain classes of books—school textbooks, for example—do not have jackets, because they are not displayed in bookshops or other places where they could get soiled. There is a tendency to-day also to print gay designs on to paper (which is afterwards covered with a protective acetate film), or on to the binding material and to dispense with the expendable paper jacket. But the majority of the books in our bookshops are wrapped in paper jackets.

The bookjacket is of comparatively recent origin, and its development over the last forty or fifty years makes an interesting study. In the very early years of the century the dust-jacket, as it was then more commonly called, was, as its name suggests, a piece of paper put round the book to protect it from dust. It was usually a piece of brown paper, and might even have been a piece of a printed sheet cut to size. Then, in the years before the First World War, publishers had the idea of making the wrapping more attractive —in the chocolate-box manner. Girls' heads began to adorn the latest novels; a publisher would have a set of girls' heads which he used over and over again, according to the colouring of the heroines described inside his books. It was but a little step from the girl's head to the depicting of an incident from the story, and, as publishers grew bolder and the public got used to the idea, bookjackets became more and more elaborate, more and more costly, and eventually indispensable. To-day the bookseller and the commercial librarian claim that many books sell (or attract the borrower) just by means of their jackets. The publishers having, like Frankenstein, built their monster, they are now its slaves,

spending sometimes as much as sixpence per copy on the bookjacket, which the average book-buyer throws away as soon as he has read the book. Some few publishers have seized upon the opportunity afforded them to make their bookjackets as distinctive as a trademark. On the whole, however, only the commercial artist and the jobbing printer really have cause to bless the highly coloured bookjacket.

The design of the coloured illustrated jacket is the province of the commercial artist. He is usually given the manuscript or proofs of a book, and is expected to produce a design which either expresses the theme of the book or depicts some incident or character from it. The finished design may be drawn in flat colours or in full tone, and may be printed from line or half-tone blocks by letterpress, or by photo-lithography, occasionally even in photogravure. For the more sober volume the typographer, either in the publisher's office or in a studio, is called into action. By judicious use of type or drawn lettering, by the blending of coloured inks, and by making the colour of his paper add to the general design he is able to produce a jacket which will be modest, blatant, tasteful, or discordant as the subject of the book or the character of the publishing house demands. The display in the modern bookshop is a tribute to his cunning and ingenuity. Whether we applaud or deplore the modern development of the bookjacket, we cannot deny that it has made the bookseller's window a more cheerful sight. It is a thousand pities that Charles Lamb did not see it; it would be good to read Elia "in praise of bookjackets," or, alternatively, "on bookjackets and other evils"!

Now at last our book is all dressed up and, if the publisher knows his business, has somewhere to go.

Note. No reference to unsewn or perfect binding has been made. This is a comparatively new development, in which sewing is omitted. The back of the book is cut and a flexible glue brushed in between the leaves. Much is expected of this in the future.

17

Finding a Home for a Book

IT is not to be imagined that the publisher waits until finished copies of the book are delivered from his binder before he begins to take steps to sell them. Advance publicity has become more and more important in recent times. Gone are the days of chaste announcement in the Press to the effect that "Messrs Hainault and Olivia have the pleasure to announce a new novel by Marie Trollope. Price six shillings. From all booksellers and libraries." That staid Victorianism has given way to every device of modern publicity. Just as the bookjacket has developed from a brown dust-cover into an expensive product of the artist or the typographer, so the simple Press announcement has become the arresting 'ad.' to which we are now so accustomed. The ingenuity and technical skill which goes into the modern advertisement has made the publisher's publicity department a most important and highly expensive part of his organization. This advertising will begin in the trade Press before the book is published, and will continue in the public Press for some time afterwards.

But we have jumped too far ahead. While the book is in process of manufacture the publisher will be thinking along lines something like this. For whom is the book intended? How can I bring it to the notice of these people? How far can I enlist the aid of the bookseller, the librarian, the Press? It may be assumed that the publisher knew something of the answer to the first question before he undertook to publish the book at all. The answer to the second question will

lie in Press advertising, circularizing, sending out review copies, circulating news-items about the book and its author, and so on. The third question involves advertising in the trade Press, the work of the publisher's representatives, and the distribution of catalogues, sales-letters, proof copies, advance jackets, early finished copies. The publisher must be thinking too about the Book Clubs, those newspapers which choose a "Book of the Month," possible serialization, and the negotiation of film, broadcasting, and television rights.

The publisher's representative is a most important factor in the launching of a book. He will be well known to the booksellers in his area; they will know to what extent they can trust his judgment and to what extent they must discount his sales talk. The representative will have formed an opinion, from his reading of the proofs and from the information supplied by the office, of the potentialities of the book he is 'subscribing.'[1] He will endeavour to persuade the bookseller to place the maximum subscription order having regard to popular appeal, local appeal, and similar factors. He will often be disappointed by the size of the order he gets, but most representatives are philosophers who remember that their book is one among some 20,000 new titles from which the bookseller has to make his selection.

Publishing day approaches. The publisher sends out review copies to the leading daily, evening, weekly, and monthly newspapers and journals all over the Commonwealth. Certain of these, like *The Times Literary Supplement*, will be on his list for review copies of almost all his books, but more specialized media will be equally (or even more) important for certain books. For instance, a good notice of a scholarly theological work in the *Expository Times* may well be worth a dozen in less specialized journals. But for the work of fiction,

[1] The term used for the soliciting of advance orders. It dates from the time when patrons were invited to sign a subscription list to enable an author to launch a new work.

the popular biography, and similar books it is to the *Sunday Times*, the *Observer*, *The Times*, the *Daily Telegraph*, the *Sunday Telegraph* and to the literary weeklies, like the *Spectator*, the *New Statesman*, and *Time and Tide*, that the publisher looks for those quotable sentences of praise which he can use in his advertisements. Books are among the few commodities which are accorded a great deal of free publicity in the Press, on the radio, and on television. Those who run the big lending libraries and booksellers pay great attention to the books which are well reviewed in the Sunday Press and over the air because they know that next day they are almost sure to get requests for these books. And a good review by a national figure has been known to turn a moderate seller into a best-seller overnight.[1]

When a book begins to sell is the time when the publisher has to exercise his keenest judgment. Shall he reprint? If so, when and how many? The rising graph of the book's sales may suddenly fall and the reprinted copies be left on his hands unsold. A good seller may, indeed, bring its publisher more problems than a slow one. Too many injudicious reprints line the road to the Bankruptcy Court for the publisher to give the order without a qualm.

And what of the bookseller? In *A Bookseller's Rubaiyat* many years ago E. V. Lucas wrote:

> What is a bookseller?
> . . . the Poet squirms
> From naked Truth; but let it go at this:
> One whose controlling Hope is Better Terms.

And those words, written over forty years ago, could not be truer had they been written to-day. Faced as he is by continually rising costs of distribution, over 20,000 new titles to cope with every year, encroachments on his territory (as he sees it) by multiple stores and others, fierce

[1] *E.g.*, Stanley Baldwin's commendation of *Precious Bane*, by Mary Webb, or Arnold Bennett's weekly articles in the *Evening Standard*.

competition from some libraries, television, and radio, is it any wonder that the bookseller so often sees his salvation in a bigger slice of the cake which he shares with the publisher? Many people think the solution lies elsewhere; but that a solution must be found is not in doubt. Too many booksellers are finding it increasingly difficult to remain solely booksellers and to refrain from selling stationery, fancy goods, and toys. And that is a bad thing, for the bookseller can and should be a very important member of the community.

In this book we have been considering all the vast store of knowledge, ingenuity, and sacrifice that lie behind the production of the modern book. Sometimes those engaged in the book trade wonder whether it has all been worth while! Between them author, publisher, bookseller, printer, and librarian have provided a rich heritage which is the public's for the asking. Is the public impressed? Let us look at a few facts.

The British like their scholarship tempered with athleticism. In a very entertaining lecture[1] Mr Harold Raymond tells of an advertisement depicting a woman worrying over her small boy.

> There he is poring over a book, a pitiable spectacle. "You don't want your boy to be a bookworm," ran the caption. "You want him to be a normal, healthy boy." However, a few doses of—I forget what—averted the tragedy. You see him in the next picture chasing a football with a happy grin on his idiot face.

At times one is inclined to think that we have lost that love of books which should be inherent in us all. And we are mean into the bargain. To-day the annual expenditure on books by British public libraries is about £5,000,000—say 1*s.* 10*d.* per head! The total expenditure on books—*i.e.*, the turnover of the book trade in the home market—is about £40,000,000. Not much when compared with the

[1] *Publishing and Bookselling*, Harold Raymond.

annual expenditure on drink (£939,000,000), or on gambling (nearly £600,000,000)!

People are meaner in general about book-buying than almost anything else. To quote Harold Raymond again:

> The other day I received a letter from a man I did not know, who said that he was starting a reading circle and would I present some books? He did not explain whether or why the members of the circle were objects of charity. He just asked for books. And that led me to wonder whether other trades are similarly solicited. Do Messrs Slazenger, for instance, receive letters from people saying they are starting a tennis club, and will Messrs Slazenger give them a gross of tennis-balls, six nets, and a motor lawn-mower?

And yet there is no finer investment than the acquisition of a library. When people were starved of other things during the last war the demand for books far outstripped the supply; and the habit of book-buying then begun has to some extent outlived the crisis. Children who are encouraged to acquire books will grow up to thank those who encouraged them. For, as Sir Winston Churchill said, "Books in all their variety offer the means whereby civilization may be carried triumphantly forward." So perhaps we may applaud the modern translation of the text from Ecclesiastes quoted in the Authorized Version at the beginning of this book: "There is no end to the *buying* of books."

APPENDIX I

A Selection of Modern Book Typefaces

MONOTYPE

BASKERVILLE

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwx
yz

BELL

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz
ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz

BEMBO

ABCDEFGHIJKLMNOP
QRSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz
ABCDEFGHIJKLMNOP
QRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

BODONI

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz

CASLON OLD FACE

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwx
yz

CENTAUR (and
ARRIGHI italic)

ABCDEFGHIJKLMNOP
QRSTUVWXYZ
abcdefghijklmnopqrstuvwx
yz
ABCDEFGHIJKLMNOPQR
STUVWXYZ
abcdefghijklmnopqrstuvwxyz

FOURNIER

ABCDEFGHIJKLMNO
PQRSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz
ABCDEFGHIJKLMNO
PQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

IMPRINT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz

GARAMOND

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxy
z

OLD FACE

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz

GILL SANS

ABCDEFGHIJKLMNOP
QRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMNOPQR
STUVWXYZ
abcdefghijklmnopqrstuvw
xyz

OLD STYLE NO. 2

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrst
uvwxyz
ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz

PERPETUA

ABCDEFGHIJKLMNOPQ
RSTUVWXYZ
abcdefghijklmnopqrstuvwx
yz
ABCDEFGHIJKLMNOPQRS
TUVWXYZ
abcdefghijklmnopqrstuvwxyz

SCOTCH ROMAN

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrst
uvwxyz
ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz

PLANTIN

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuv
wxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz

TIMES

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz

POLIPHILUS (and BLADO italic)

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

WALBAUM

ABCDEFGHIJKLMNOPQ
RSTUVWXYZ
abcdefghijklmnopqrstuvw
xyz
ABCDEFGHIJKLMNO
PQRSTUVWXYZ
abcdefghijklmnopqrstuvwx
yz

LINOTYPE

BOOKPRINT

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrst
uvwxyz
ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrst
uvwxyz

GEORGIAN

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz

CALEDONIA

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz

GRANJON

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz

ESTIENNE

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz

PILGRIM

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnopqrstu
vwxyz

APPENDIX 2

Books for Further Reading

ALDIS, H. G.: *The Printed Book* (Cambridge University Press).
ANON: *An Introduction to the Linotype* (Linotype and Machinery, Ltd).
BLAND, D.: *The Illustration of Books* (Faber).
COCKERELL, DOUGLAS: *Bookbinding* (Pitman).
CORRIGAN, A. J.: *A Printer and His World* (Faber).
CURWEN, HAROLD: *Processes of Graphic Reproduction in Printing* (Faber).
GRANT, JULIUS: *Books and Documents* (Grafton).
(AND OTHERS): *Paper Making* (British Paper and Board Makers' Association).
HAMPDEN, JOHN (Editor): *The Book World To-day* (Allen and Unwin).
HARRISON, FREDERIC: *A Book about Books* (Murray).
JENNETT, SEÁN: *The Making of Books* (Faber).
MCLEAN, RUARI: *Modern Book Design* (Faber).
MADDOX, H. A.: *Paper* (Pitman).
MUMBY, F. A.: *Publishing and Bookselling* (Cape).
PHILIP, JAMES: *English Book Illustration, 1800–1900* (King Penguin).
ROSNER, CHARLES: *The Art of the Bookjacket* (H.M.S.O.).
SIMON, OLIVER: *Introduction to Typography* (Penguin).
STEINBERG, S. H.: *Five Hundred Years of Printing* (Penguin).
TARR, J. C.: *Printing To-day* (Oxford University Press).
THOMAS, DAVID: *Type for Print* (Whitaker).
UNWIN, SIR STANLEY: *The Truth about Publishing* (Allen and Unwin).

Periodicals

Book Design and Production.
Bookseller, The.
British Books.

Glossary

antique (paper): a good, bulking paper with a rough surface, which may be either *antique wove* or *antique laid* (see page 57).

aquatint: a method of etching on copper, resulting in close imitations of watercolour or Indian-ink drawing.

art (paper): a paper coated with China clay or casein to give a smooth surface so that half-tone blocks may be printed on it.

ascender: the ascending part of such letters as b, d, f, and l.

ass: the part of the vat used for handmade-paper making (see page 79).

auto-lithography—see **lithography**.

beater: used in papermaking for preparing pulp for the machine.

bed: the table of a printing-machine on which the forme lies.

bestiary: a medieval moralizing treatise on beasts.

black letter: a Gothic or Old English type design.

blocking: a process in mechanical bookbinding by which the lettering and design, if any, are impressed on the cloth surface of the case.

body: (*a*) the thickness of a type from back to front; (*b*) **body paper**, base paper which is finished by calendering or coating.

breast box: the levelling tank on a paper-machine, used to control the flow of the stuff on to the wire.

breast roll: the roller on a paper-machine which helps to support the wire.

calender (to): to glaze or polish the surface of paper by passing it between rollers, or calenders. Hence, **supercalendered**, a highly polished paper.

case: a tray for housing movable type; the **upper case** contains the capitals and the **lower case** the small letters.

cast off (to): to estimate the number of printed words in a manuscript or typescript.

chase: a metal frame in which type pages are locked for printing.

codex: a manuscript volume, especially of the Bible.

collate (to): to gather sheets of a book together in the correct order.

collotype: a method of printing illustrations from plate of gelatine etched by actinic rays.

colophon: a tailpiece in old books; now used to describe a publisher's device on a title-page.

composing stick: a holder in which a hand-compositor assembles letters.

copy: any matter that the printer is to set up in type.

couch: a felt-covered board on which handmade paper is placed for drying.

couch roll: a suction roller on a papermaking machine.

crown: a standard size of paper, 15 in. × 20 in.

dandy roll: the watermarking roller on a papermaking machine.

deckle: a wooden frame used in handmade-paper making; **deckle-edge:** the irregular edge characteristic of handmade paper; **deckle-straps:** rubber straps on a paper-machine to prevent the stock from flowing over the sides.

demy: a standard size of paper, $17\frac{1}{2}$ × $22\frac{1}{2}$ in.

doctor: a steel blade which scrapes superfluous ink from the plate on a photogravure-printing machine.

dry end: the end of the paper-machine where the web has formed into a firm sheet.

electrotype: a facsimile printing-plate formed by electrolysis.

esparto: coarse grass, from Spain and North Africa, used in papermaking.

foolscap: a standard size of paper, $13\frac{1}{2}$ in. × 17 in.

fore-edge: the front edge of a bound book.

forme: type and blocks secured in a chase for printing.

frisket: a thin iron frame with tapes across it for keeping the sheet in position while printing.

furnish: a mixture of rags, wood, and esparto for making paper.

furniture: wood and metal material used for filling up the blank spaces around and between the pages of type.

galley: a flat tray for holding type before it is made up into pages; **galley proof:** proof from this.

half-title: a page placed traditionally before the title-page and displaying only the title of the book.

half-tone: letterpress printing-plate for the reproduction of photographic illustrations where **half-tones** are needed as opposed to flat solids.

imposition: the placing of type pages in correct order in the chase.

intaglio: printing from an etched surface—*e.g.*, photogravure—as opposed to letterpress, or printing from a relief surface.

interlay: a sheet or sheets of paper placed between printing-plate and mount for varying the pressure on different parts of the plate.

Intertype: a method of mechanical composition in which complete lines of type are cast.

justification: the equal spacing of words in a line of type to a given width.

kern: that part of a type which overhangs the body, such as the head and tail of an italic *f*.

keyboard operator: a compositor who operates the keyboard of a typesetting machine.

laid lines: lines watermarked by dandy roll in **laid** paper.

lead: a piece of metal for spacing lines of type.

letterpress: printing from a raised surface from type or blocks.

line block: a letterpress printing-plate, photo-mechanically produced for reproduction of **line** work, without intermediate half-tones.

Linotype: a method of mechanical typesetting in which complete lines of type are cast.

"Linson": a binding fabric which closely resembles cloth.

literal: a proof correction of a misplaced or wrong letter.

lithography: literally, printing from stone, now superseded by metal plates. The image is drawn direct on to the plate (**auto-lithography**) or printed down photographically (**photo-lithography**).

loading: mineral or chemical substances added to the furnish in papermaking to improve surface, opacity, absorption, etc.

machine-coated: art paper which is coated on the paper-machine—*i.e.*, not as a separate process.

machine direction: the direction of grain in paper, corresponding to the direction of flow on the machine.

machine-finished (M.F.): paper which is finished on the paper-machine—*i.e.*, not calendered separately.

make-ready: the process of preparing type-forme or blocks on the machine for printing.

matrix: (*a*) a brass or phosphor-bronze mould from which type is cast; (*b*) papier-mâché mould taken from a type-forme.

mechanical: a low grade of paper made from wood-pulp which has been prepared by grinding.

mechanical tint (Ben Day tint): patterning applied to a line drawing to give an impression of toning.

Miehle: a two-revolution printing-machine; originally the maker's name, but now applied to many machines of this kind.

monochrome: an illustration in one colour.

Monotype: a method of mechanical typesetting by which type is cast in single letters.

morocco: leather made from goatskin tanned with sumec; **French morocco:** a low-grade, small-grained kind of this.

mould: an impression of type and line blocks made in papier-mâché or plastic material.

mull: a material, like coarse butter-muslin, used in bookbinding.

nip rolls: rollers on the paper-machine for imparting a smooth surface to paper.

octavo (8vo): a standard division of a paper sheet—*e.g.*, crown =15 in. × 20 in.; crown 8vo = 7½ in. × 5 in. (one-eighth).

overlay: a sheet of paper cut to shape and placed on the impression cylinder or platen bed in make-ready, to regulate the pressure on different parts of the forme.

palimpsest: a manuscript from which the original writing has been erased and on which fresh writing has been substituted.

papyrus: an Egyptian reed used in making an early form of paper; hence, the material made from these reeds.

perfector: a printing-machine which prints both sides of a sheet in one combined operation.

photogravure: a method of printing from etched copper plates.

platen: a plate in a printing-press by which paper is pressed against type.

point: a standard of measurement used by the printer. There are 72 points to the inch.

potcher (or *breaker*): a machine for separating fibres in pulp for papermaking.

pure—see **wood-free**.

quad: a standard multiple of paper size—*e.g.*, crown = 15 in. × 20 in. quad crown = 30 in. × 40 in.; also a large metal space used in typesetting.

quarto (4to): a standard division of a paper sheet—*e.g.*, crown = 15 in. × 20 in.; crown 4to = 10 in × $7\frac{1}{2}$ in. (one-quarter).

reader: one who reads proofs for the press.

register: the correct superimposition of printing-plates in colour printing; also the placing of type so that the margins on both sides of a sheet are identical.

retree: faulty sheets of paper thrown out in sorting.

rotogravure: photogravure printing by rotary machines.

royal: a standard size of paper, 20 in. × 25 in.

signature: a letter or figure placed by the printer at the foot of the first page of each sheet as a guide to the binder; hence, such sheet after folding.

sixteenmo (16mo): a standard division of a paper sheet—*e.g.*, crown = 15 in. × 20 in., crown 16mo = 5 in. × $3\frac{3}{4}$ in. (one-sixteenth).

sizing: a substance introduced in papermaking to reduce its capacity for absorbing liquid; **engine sizing:** sizing performed in the beater-engine; **tub sizing:** method of sizing performed as a separate process from papermaking.

slug: a line of type composed and cast in one operation.

solid: an area of type without leads between the lines.

stereotype: a duplicate printing-plate cast from a papier-mâché or plastic mould.

subscription: offering a new book to booksellers for the purpose of obtaining pre-publication orders.

suction-box: the part of a paper-machine for extracting water from the web.

supercalendered—*see* **calender.**

twin-wire: a paper-machine having two wires which enable it to produce a sheet with both sides of equal smoothness.

tympan: the frame on a hand printing-press for regulating pressure.

underlay: a sheet or sheets of paper placed under a block or forme to regulate pressure on different parts of the forme.

vat: a rectangular tank in which paper is made by hand.

waterleaf: handmade paper before sizing.

wet end: the beginning of the paper-machine where the stuff is poured on in liquid form.

Wharfedale: a stop-cylinder printing-machine; originally a trade name, now used to describe this type of machine.

wire: the copper mesh on a paper-machine on which the stuff is suspended as water drains away.

wire-mark: the pattern of paper-machine wire to be seen on the under-side of a sheet.

wood-free: paper containing only chemical wood-pulp—*i.e.*, free of mechanical wood-pulp; sometimes called 'pure.'

zinco: a process line block.

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